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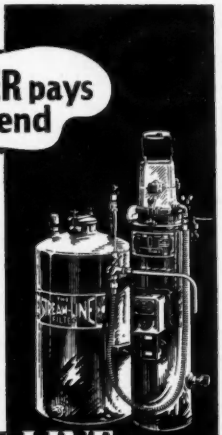
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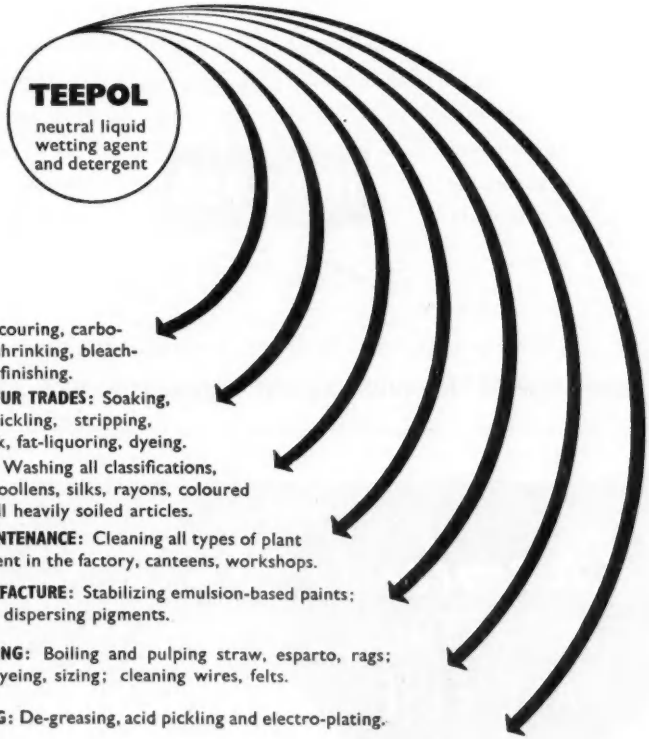
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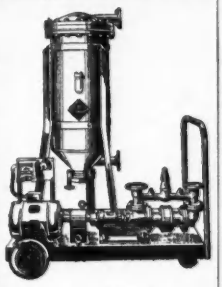
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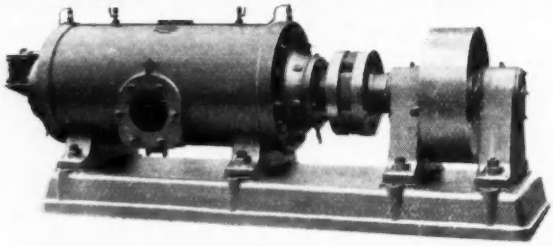
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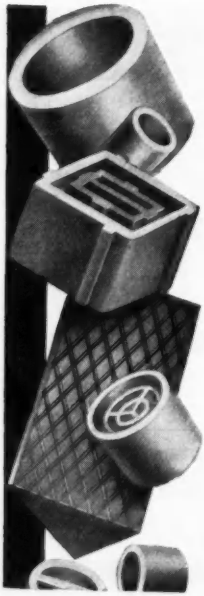
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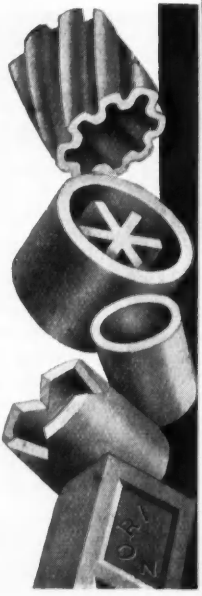
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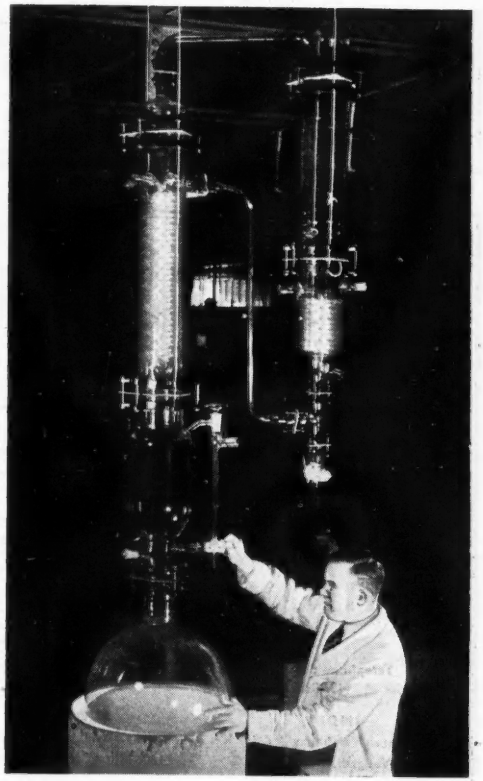
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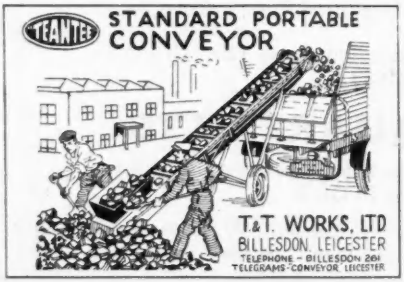
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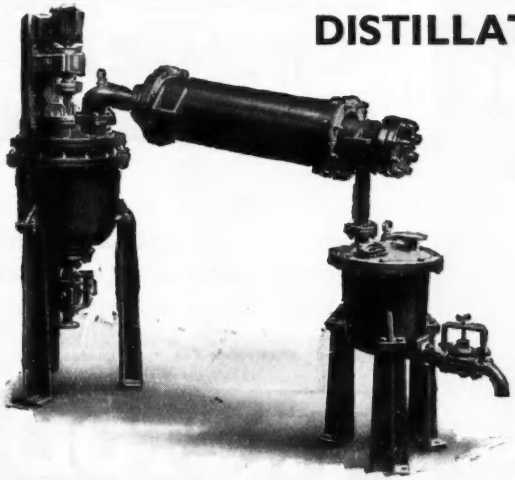
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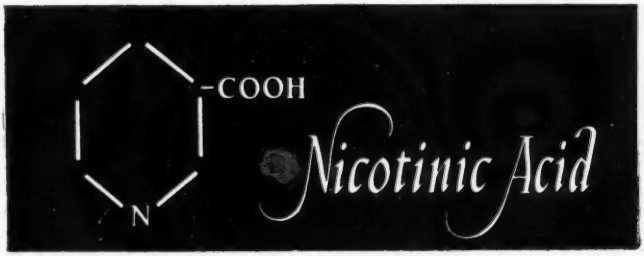
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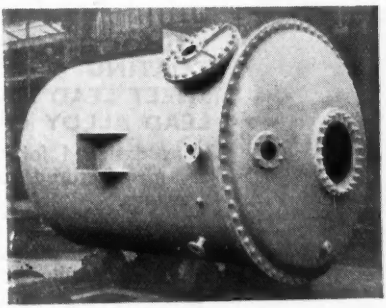
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Contrasting Rewards

A CENTURY ago, as Sir Charles Darwin has recalled, scientists were regarded either as amiable amateurs, or as enthusiastic madmen, who must at all costs be kept away from all really important matters. The change that a century has brought about could not be more strikingly exemplified than by the fact that to-day few practical projects are launched before the scientists have been consulted. The scientist has taken the place of the oracle of the ancients, as an oracle with powers derived not from superstition but from a continually widening knowledge of cause and effect. There were enlightened men in the ancient world, to be sure. It was Euripides who wrote (substantially) this: "Blessed is the man who has laid hold of the knowledge that comes from the inquiry into Nature. He stirreth up no evil for the citizens, nor gives himself to unjust acts, but surveys the ageless order of immortal Nature, of what it is composed and how and why."

No longer is it customary to consider all scientists to be amiable amateurs, but we still expect some of them to be enthusiastic madmen. That is illustrated particularly by our behaviour towards teachers of higher science and technology, who are no longer required only "to survey the ageless order of nature." We expect them to make available to all comers what they and their predecessors have discovered for the ultimate uses of industrial commerce. The scientific and technical potential of the teacher must be higher than that of the taught. Like water, knowledge does not normally flow uphill. Regardless of all this, it is still considered logical to pay the teacher—unless he is head of his department—generally less than industry is prepared to pay his student in his first post after leaving the technical college or university.

This is an urgent and inseparable problem in chemical engineering, in which the teacher must be a qualified chemical engineer. Properly to prepare his pupils for the examinations of the Institution of Chemical Engineers he must possess a fund of knowledge comprising wide fields of chemistry, physical chemistry and engineering. For those attainments he may be rewarded with some £400-£500 a year, while his students in their first post may be offered between £400 and £700 a year. That would appear about as logical as the practice of the ancients of determining the course of future events by studying the appearance of the entrails of some hapless fowl.

The position of teachers of evening classes is no better. They get "the rate for the job," according to which an hour's teaching is well paid (it is complacently assumed) at 10s. or £1 an hour. That may be reasonable for a man teaching elementary mathematics or languages to schoolboys, assuming that further time is

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not occupied in correcting students' work. If, however, he is teaching chemical engineering, or any other of the more advanced subjects, he must spend quite a considerable time in preparation. Taking all things into account, he may in the long run receive for his work a scale of payment roughly equivalent to that of his charwoman. Yet still the indispensable work is carried on: the race of "enthusiastic madmen" is not quite extinct.

The foregoing represents one aspect of an illogical tradition, of which some others, notably that associated with medicine, is being very fully exposed to public criticism. The medical student may also be acquainted with poverty in the years required to pass his first, second and third M.B. examinations and to perform his allotted apprentice service in the wards. Now, however, by the present scales proposed for the payment of practitioners of the Government health service, and especially of medical specialists who are to be assured of something like £2,000 a year at the age of 32 and should receive at least £3000 by the time they are 40, the great financial gap between the teacher and the taught becomes a veritable chasm. Not unexpectedly, it is now being found there is a shortage of teachers and research workers for the medical profession because of the growing disparity between the payment of the basic sciences staff and to the "walking the wards" staff. In short, the medical profession has much the same difficulty as exists in the rest of the scientific and technical world. The recently issued Spens Report appears likely to result in increasing this disparity, and greatly aggravating the position.

One of the obvious sources of the present anomalies is that technical education comes generally under either Government departments or local authorities. Both are notorious for paying low salaries. An inquiry into the whole position of the salaries of teaching and research staffs in universities and technical colleges is now being made by a special committee called together by the Parliamentary and Scientific Committee. The latter, composed of Members of Parliament and representatives of technical and scientific bodies, enjoys a standing which should ensure that whatever representations it may make will not be lightly treated in the highest Government circles. This, then, would appear to be the opportune moment to bring to the notice of the members of the sub-committee (THE CHEMICAL AGE, *60*, 401) the representations which victims of the present system are well entitled to make.

The position of specialists in Government service equally demands consideration. Something has been done to improve their lot, but we are not convinced that their

(*Continued on page 510*)

NOTES AND COMMENTS

Saving Steel

THE present rise in steel prices which has followed the Government decision to suspend payment of "subsidies" on steel, excepting imported finished steel, must involve a noticeable addition to production costs—of chemical plant and equipment and a host of other finished products. The overall rise, thought to represent an addition of about 9 per cent, is unwelcome and inopportune, especially from the point of view of the export trades, and perhaps the only bodies which will be able to view the further impediment to the free use of steel without alarm are the Institute of Welding and the British Welding Research Institute. The higher charges underline in a most emphatic way the value of the lessons imparted at the recently concluded conference which the institutes sponsored on the use of welding to save steel and manpower. Aided by the new financial argument, the case for the substitution of welding processes for much of the work now carried out by casting and riveting gains much more weight, especially in the facilities offered for the re-building of worn or damaged plant and components. One of the main tasks now lying before the sponsors of the increased welding programme is to educate potential users to the entirely new technique required. Particularly in welded construction, a compromise between traditional methods and the new is not feasible. Successful welding, in effect, starts in the drawing office.

Radiochemistry

THE anniversary meetings of the Chemical Society included a three-day symposium at Oxford from March 28 to 30 on "The Chemistry of the Heavy Elements" and a discussion in London on "The Use of Radioactive Tracers in Chemistry." At Oxford the several hundred delegates were also privileged to visit the Atomic Energy Research Establishment at Harwell. The many papers, which were given by authorities from diverse countries, dealt with the physical, inorganic and analytical chemistry of the heavy elements, and the preparation, nuclear aspects and applications of radioactive tracers (*page* 516, *this issue*). To the academically-minded chemist one of the most interesting features of the conference was the considerable discussion devoted to the exact status of the cis- and trans- uranium elements in the periodic system. The existence of a second series of rare-earth elements "the lanthanides" was the subject of debate from which one clear conclusion was of the existence of a great body of work to be done before agreement can be reached. The impression made upon the industrial chemist by all this is a clearer recognition that these new radiochemical methods will help him to solve his problems, be they inorganic, physical, organic or biochemical. Of special significance in this connection was the obvious eagerness of the "radiochemists" to assist by advice or example in the solution of general chemical problems. In particular, lecturers from AERE stressed how the absence of red-tape at Harwell enabled purchasers of radio-active materials to deal directly with technical people and readily gain the benefit of their experience. The papers will appear in a forthcoming issue of the *Journal of the Chemical Society*, but even before that the influence of the meetings will be felt in many spheres. There is no doubt that chemists will have been greatly encouraged to apply these new techniques.

Awards and Investments

THE catholicity of the good work of the Royal Society of Arts, devoted to rewarding merit in so many arts and sciences, was effectively mirrored in a small news item during the past few days. It told of the award under the Thomas Gray Memorial Trust of £50 for "a deed of outstanding professional merit by a member of the British Merchant Navy," a reminder of the skill so constantly displayed at sea. The award was to Mr. Albert Edward Johnson, 60-year-old uncertificated third hand, who in a severe gale took control of the trawler *Kelvinway*, and, regardless of the fact that various automatic gear was out of action, succeeded in bringing the vessel safely back to Copinshay in the Orkney Islands, and from there

to Aberdeen. It is the happy function of the RSA to reward professional merit almost, it would appear, whenever it finds it, so far ranging are the trusts of which it is the custodian. And in specialised fields it has powerful contemporaries, of which the Chemical Society is the fountain from which great benefits to the pursuit of chemical knowledge have flowed for many generations. This is brought to mind again this week by the mention of the society's research fund which provides grants for research in all branches of chemistry. About £700 annually is available from donations of the Worshipful Company of Goldsmiths, the Perkin Memorial Fund and other sources, in addition to the donations from the Government and industry, amounting together to about £2650 annually. The contrast between private benevolence and what must be regarded as an investment by Government and manufacturers is marked. The disparity will be grotesque if the possibility, referred to by Sir Ian Heilbron last week, of a reduction by 10 per cent of the Government grant becomes reality.

Office Amenities

A CURIOUS anomaly amid the elaborate, detailed and generally satisfactory legislation safeguarding health and welfare in chemical works has been the exclusion from the provisions of the Factories or the Mines and Quarries Acts of " shops and offices " which happen to be outside " the close or curtilage or precincts " of the works. This illogical distinction is now likely to be swept away on the strong recommendation of the Gowers Committee, whose newly issued report on health, safety and welfare of " non-industrial " workers and the hours of employment of juveniles, proposes the extension to all such offices of standards similar to those procured by the Factories Acts. The Government having given an assurance in the past that amending legislation on some such lines would be favourably received, the Gowers report is confidently expected to receive Government approval in a very short time. Having regard to the good conditions prevailing throughout nearly all large chemical works, the changes which may be necessitated in office accommodation and conditions will not be sweeping. It is recommended, for example, that the level of the Factories Acts shall be observed in such contexts as sanitary accommodation, ventilation, temperature, lighting, cleanliness and clothing space, that there shall be at least 400 cu. ft. of air space per worker. The use of underground rooms would also be subject to the factory restrictions and the management's responsibility in certain circumstances to provide meal rooms would be legally enforceable. It speaks well for present day standards in the clerical and related departments of industry that the Gowers report is likely to require of employers rather less than they have voluntarily provided.

CONTRASTING REWARDS

(*Continued from page* 508)

status and remuneration are adequate by comparison with the purely administrative staff. There is undoubtedly a feeling of " discomfort and disquiet," as Sir John Anderson recently reminded the Parliamentary and Scientific Committee, among scientists in the public service. The subcommittee mentioned will review this subject also. Sir John Anderson has pointed out that scientists in the public service include (a) the research organisations, and (b) the scientific advisers attached to the Government departments. These latter have no chance of doing original work, and the appointments must be made sufficiently attractive to bring to them men with qualifications and gifts of the kind for which more generous rewards are offered in other spheres. This is not only a question of salary; it might involve periodic interchange with organisations outside the Government service.

The provision of these and other incentives to undertake the teaching of science and to fulfill the growing need of scientific servants of the Government calls for a more generous policy. This, in our view, is a subject of which scientific men must not allow themselves to be merely observers. They have every reason to put forward their representations through the Parliamentary and Scientific Committee and they should not allow the opportunity to pass.

Steel to Cost More

Government Saving of £25 M. Yearly

THE abolition of the steel subsidies, representing principally the withholding of Government contributions to the cost of imported ore and scrap, was announced in the House of Commons last week by Mr. G. R. Strauss, Minister of Supply. As from April 1, the full cost of the various operations on which the Treasury had been carrying losses would be passed on to steel consumers.

The Government will save about £25 million in the Budget year 1949-50, but prices of steel and steel products will increase by an average of about—10 per cent. It will however, continue to bear some of the losses of importing finished steel and selling it to consumers at the domestic price at a loss of about £2.9 million a year.

Reduced Profits

The Iron and Steel Board (which was kept alive after its apparent dissolution until March 31, to complete a thorough review of iron and steel prices) has presented a new price list for the various products in order to ensure that the industry's profits are cut rather than increased.

The old and new net prices of representative products, together with the increases, are :—

MAXIMUM BASIC PRICES

	Old	New	Increases
	(per ton, except for tinplate)		
	£ s. d.	£ s. d.	£ s. d.
Basic pig iron ...	9 5 0	9 17 6	0 12 6
Hematite pig iron	10 2 6	11 16 6	1 14 0
Foundry pig iron	9 10 3	10 0 6	10 3
Soft basic billets	14 7 0	17 1 6	2 14 0
Heavy and medium sections ...	7 1 6	19 13 6	2 12 0
Plates	17 16 6	20 14 6	2 18 0
Rails	16 16 6	19 2 6	2 6 0
Wire rods ...	18 10 0	21 2 3	2 12 3
Re-rolled bars ...	19 10 0	22 6 0	2 16 0
Re-rolled sections	19 0 0	21 16 0	2 16 0
Hot-rolled hoop and strip ...	20 5 0	23 1 0	2 16 0
Black sheets ...	25 1 0	28 16 0	3 15 0
Tinplate (per box)	1 17 5½	2 1 6	4 0½
Cold-rolled strip	29 11 6	31 15 6	2 4 0
Bright steel bars	29 13 0	23 2 3	1 9 3
Wire	25 17 6	28 0 0	2 2 6
Forging ingots ...	15 8 0	17 16 0	2 8 0
Alloy steel billets	22 17 3	25 6 9	2 9 6
Colliery arches ...	19 16 6	23 0 3	3 3 9

The steel industry has agreed to the abolition of all loyalty rebates and the new prices in the Iron and Steel Control Order are net.

Aluminium Dearer.—Due to an increase in the cost of imported supplies, the price of virgin aluminium in ingot form was raised last week from £87 to £90 a long ton delivered to consumers' works. There is the usual £2 10s. a ton addition for metal in notch bar form.

Relaxing Acid Controls

New Price Scale for Sulphuric Acid

THE removal of the existing Board of Trade maximum price control of sulphuric acid—battery or accumulator acid, reagent acid and acid containing not more than 25 per cent free SO_3—and the substitution of a new schedule at a lower scale for all other strengths is announced. Effect to these changes is given, with effect from April 1, by the Control of Sulphuric Acid (No. 5) Order, 1949, in which the relevant schedule is expressed as follows :—

ADDITIONS TO BE MADE TO THE BASIC PRICE

(*a*) Sulphuric acid (H_2SO_4) :	
(i) of a strength less than 75.51 per cent H_2SO_4 (136° Tw. at a temperature of 60° F.).	An amount calculated at a rate per ton which bears to 35s. 6d. the same ratio as the percentage of H_2SO_4 in the content of that acid bears to 77 per cent.
(ii) of a strength not less than 75.51 per cent H_2SO_4 (136° Tw. at a temperature of 60° F.) and not more than 84.02 per cent H_2SO_4 (155° Tw. at a temperature of 60° F.).	An amount calculated at the rate of 35s. 6d. per ton.
(iii) of a strength more than 84.02 per cent H_2SO_4 (155° Tw. at a temperature of 60° F.) up to and including acid containing not more than 25 per cent free SO_3.	An amount calculated at the rate of 26s. 6d. per ton.
(*b*) Acid delivered in a tank wagon or container when an invoice is furnished stating separately the amount to be added under this head.	The amount by which the actual cost of delivery exceeds the reasonable cost of delivery in the same or similar conditions during the basic period.
(*c*) Acid delivered in the seller's railway tank wagon.	An amount calculated, in respect of the demurrage on such tank wagon detained at the purchaser's sidings, at the rate of 6 shillings per wagon for each day of such detention excluding the day of arrival, the day of departure, one further day, Bank Holidays, and the period from Saturday noon to midnight on the Sunday next following.

LEAD, ZINC PRICES CUT

CONFIRMATION of the expectation that the drop in values of non-ferrous metals in the U.S.A. would be followed by a reduction here is afforded by the announcement this week by the Ministry of Supply of reductions in the prices of virgin lead and zinc.

The new selling prices per ton delivered are :—Good soft pig lead, £106 ; good ordinary brand and prime Western zinc, £101 ; refined electrolytic zinc, £101 15s. ; not less than 99.99 per cent pure zinc, £103 5s.

At the beginning of 1948 virgin pig lead was valued around £123 per ton.

Fresh Bid for Welding Progress

Wider Distribution of Technical Information

A CONCERTED campaign by the Institute of Welding and the British Welding Research Association to secure wider recognition of the advantages of welding and the adoption of welding principles in metal construction, repair and other uses has been launched as a result of the conference on "Welding as An Aid to the Saving of Steel and Manpower" which concluded at Ashorne Hill, Leamington Spa, on March 25 (THE CHEMICAL AGE, *60*, 360).

Some of the means of implementing the aims of the conference were described in London last week to the technical Press by Dr. D. H. Paterson, chairman of the Institute of Welding. He indicated that it was intended to support the lessons of the conference by printed information, tables and designs showing the best practice, the properties of all kinds of sections and how to make them and an analysis of costs.

Successful Application

Dr. Paterson said there were already a number of examples of the successful application of welding, as against riveting, and they knew of many other spheres in which it might well be used to advantage, but the people concerned had still to be convinced. Welded steel railway wagons were a good instance of successful application; to day practically none was welded.

At the conference papers were read on welding as applied to machine tool construction, shipbuilding, railways and constructional engineering.

This conference has considered the saving in steel and manpower that can be achieved by the application of welding to machine tool construction, in the replacement of castings in general engineering practice, in shipbuilding, in railways, and in structural engineering. The conference has concluded that while a considerable saving is in fact being achieved, a wider knowledge of this saving is essential. Further economies could be readily effected by an increase in the use of welding and a more informed approach in many fields in which it is now being used.

The findings, as agreed at the final session, have been circularised as follows :—

1. Vigorous steps should be taken to disseminate a knowledge of the advantages of welding, of correct welded design, and of the available welding processes and production methods as widely as possible throughout steel-using industries. This information should reach, in particular, designers, draughtsmen, planning and production engineers, and supervisory grades.

2. In all those branches of engineering which were considered at the conference, it was plain, and should be emphasised, that in order to obtain the fullest possible advantage, designs must be prepared specifically for welding, and previous design methods based on other practices, such as casting and riveting, must not be slavishly copied.

3. In order to take full advantage of the reduction in costs which can be achieved by welding, an industrial establishment must be laid out primarily for welded construction. It is recognised that during the period of change-over to welded construction the full economic advantage of welding will not be attained.

4. Maximum advantage should be taken of the versatility of welding in maintenance work and for reclaiming damaged or worn parts.

5. Further advantage should be taken of the opportunities for economic design offered by welding. For example, the plastic design method applied to structures would effect a substantial saving in steel.

6. Research should be pressed forward, and certain new research work initiated, into new design methods which will give further economies in welded structures.

7. Automatic and semi-automatic welding methods should be applied whenever practicable.

8. Authorities producing standards and codes of practice should be asked to reconsider their standards and requirements in certain cases where an unnecessarily large margin of safety appears to be demanded.

9. Steelmakers should be urged to roll those special sections which would assist in applying welding to better advantage in structures and ships.

10. Continued efforts should be made to improve the quality of production welding. In this connection, the extended use of non-destructive methods of inspection is worthy of mention.

11. The use of weldable-quality high tensile steels should be extended.

12. Research on new weldable alloy steels should continue to be vigorously pressed.

13. Since stress-relieving can be an important element in cost, the necessity for applying it to the present extent should be the subject of research.

14. Steel of low notch-sensitivity is an urgent requirement.

15. The economy which can be achieved in welded construction by the use of light gauge sections should be further developed.

S. AMERICAN STEEL PLAN

A NEW steel plant in Venezuela, Siderurgica Venezolana (Sivensa) S.A., designed to utilise local scrap, is expected to be in full production by June this year, according to a statement by the company. An annual production of 20,000 tons is anticipated. The plant is being financed by American and Venezuelan capital. The plant intends to operate entirely on scrap, and reports indicate a large tonnage available in the Caracas area where the mill will be located. Although Venezuela has substantial deposits of iron ore, it produces little coal. The production of pig iron is therefore uneconomic and any indigenous steel industry must rely primarily on scrap for charging its furnaces. There is, however, an abundance of natural gas and the company believes its outlook will be improved if current experiments in the production of sponge iron using natural gas as a fuel are successful.

THE CHEMICAL SOCIETY

Individual and Collective Achievements Recognised

THE trends, recent achievements and some outstanding problems confronting contemporary chemists were effectively summarised at the dinner in London last week, following the 108th annual meeting of the Chemical Society.

One of the more serious problems was represented by the possibility referred to by the president, Sir Ian Heilbron, of a reduction by 10 per cent of the Government grant to the society (£900 yearly), which, with the £1750 received from industry, was already scarcely adequate. Any reduction, the president foresaw, would involve curtailment of publishing by the society, and would give rise to a sense of frustration among university workers and a falling off of scientific manpower.

Science in War

An appreciation of what chemistry and some individual chemists had achieved was given by Sir Edward Appleton, proposing the toast of the Chemical Society and of the president, who, he declared, "did more than anyone else to spread the influence of chemistry in what was called by many people a physicists' war. He took a preliminary part in the organisation of research on explosives and chemical defence. He succeeded in making fabrics for camouflage purposes out of seaweed—a feat which seems remarkable even for a chemist. And, above all, he took over the organisation of chemical insecticide research at a time when malaria was the most powerful of our enemies in the East and typhus was a grave threat in the West." By his work on DDT many thousands of casualties were prevented. And yet he managed to continue to direct work of his own research students in South Kensington where notable work was done on many subjects, particularly on the chemistry of penicillin.

"As a physicist I've been glad to note over the years the narrowing of the gap between your subject and mine," said Sir Edward Appleton. "While, in the world outside, it is generally being said that mankind as a whole is steadily moving towards the left there seems to me in the world of chemistry a general drift of another kind—the physiologists are becoming bio-chemists, the bio-chemists are becoming organic chemists, the organic chemists physical chemists, while the physical chemists are rapidly becoming physicists. I don't know what you would call that, but I would certainly say that it is a drift to the right.

"As an outside spectator of the chemical

(*Continued at foot of next page*)



Sir Ian Heilbron presenting to his predecessor as president of the Chemical Society, Sir Cyril Hinshelwood, the Longstaff Medal which is awarded every three years to the Fellow whose research has most usefully advanced chemical science

Promising New Chemical Intermediates

U.S. Development of Isopropyl Phenols

As a result of extensive research on synthetic organic chemicals derived from coal the chemical division of Koppers Co., Pittsburgh, Pa., is now able to make the new intermediates, the isopropyl phenols, available in commercial quantities.

It is claimed that output can be greatly expanded as compounds are being produced at the company's plant at Oil City, Pennsylvania, by chemical synthesis rather than by refining of coal tar or by-product materials. When available in larger quantities they will be valuable for many applications not open to the cresols and xylenols, the supply of which is limited by the amount of coal tar available to refiners.

The isopropyl phenols are produced in three grades. Ortho-isopropyl phenol, a relatively pure ortho isomer; meta para-isopropyl phenol, a close-boiling mixture of the meta and para isomers, and di-isopropyl phenol, a mixture of the dialkylated phenols.

The properties and chemical reactivity of the isopropyl phenols are somewhat similar to those of the corresponding cresol isomers. The physical properties of the pure isomers are as follows:—

	Ortho	*Meta*	*Para*
Freezing point ...	15.8° C.	25.9° C.	63.2° C.
Boiling point—			
760 mm Hg. ...	214.1° C.	228.6° C.	228.5° C.
20 mm Hg. ...	122° C.	127° C.	127 °C.
Solubility in 10 per cent NaOH ...	Complete	Complete	Complete

The chemical reactivity of the isopropyl phenols is typical of the lower mono-alkyl phenols. The phenolic hydroxyl group may undergo reactions such as esterification and etherification; the aromatic nucleus is subject to reactions such as halogenation, nitration, alkylation, aldehyde condensation, and hydrogenation. Phosphate esters of the isopropyl phenols can be prepared by reaction with phosphorus oxychloride, and derivatives such as dinitro-ortho-isopropyl phenol can be prepared by reaction with nitric acid.

Although previously available to research workers only in limited quantities, the isopropyl phenols already have been found to have several promising uses. The alkyl phenols themselves are powerful high-boiling solvents which are valuable for certain wire-coating compositions and for use in engine cleaning formulations. The phosphate esters offer promise as plasticisers for vinyl resins and related materials. The dinitro derivative of the ortho isomer has definite value as a selective herbicide and insecticide, and offers the special advantage that the sodium salt is extremely soluble in water.

Other uses for which the isopropyl phenols are suggested include the preparation of lubricating oil additives, the manufacture of phenolic surface-coating resins, and the production of rubber processing chemicals.

Samples of the several grades of the isopropyl phenols are now available to research and development chemists.

THE CHEMICAL SOCIETY

(*Continued from previous page*)

scene I continue to marvel at the chemist's skill in unravelling the structure of complex organic molecules and in synthesising materials of vital importance to the community. Vitamins, hormones, antibiotics like sulphonamides and penicillin are no longer structural mysteries to you. Indeed your successes tend almost to make other people lazy.

"It is being said nowadays that, in the race between population growth and food production, population increase is winning; and both scientists and economists are urgently examining the problem of increasing world food supplies. Especially useful and promising in this connection is the chemist's progress in producing proteins, fats and carbohydrates by non-agricultural methods.

"Some remarkable successes can already be recorded in the production of proteins in food yeast, using micro-organisms, and in the production of carbohydrates, fats and proteins, using fresh water green algæ. But there still remains unsolved the basic problem of photo-synthesis, the problem of devising an efficient direct way of converting radiant energy from the sun into chemical energy.

"At present it is possible to grow food without the use of the soil, but no way of by-passing the living cell as an essential element in photosynthesis has been discovered. Here, then, is a challenge worthy of all your professional skill and I do not doubt that the members of your society are accepting this challenge with all the zest and enthusiasm which have characterised their activities during the last century."

ADVANCED INSTRUMENT DESIGN

Notable Display at the Physical Society Exhibition

THE 33rd exhibition of the Physical Society opened this week in London and it contained, as usual, in its chemical section, a number of new items of great interest to the practising chemist, as was shown, in fact, by the crowd that flocked round the exhibits.

An outstanding exhibit, in more ways than one, was the fractionating apparatus by Griffin & Tatlock. This showed the latest practice in experimental batch fractionation. The columns were filled, respectively, with Dixon gauze rings, Fenske helices, and Raschig rings; reflux meters were provided, and reflux heads with manual or automatic reflux and take-off metering control.

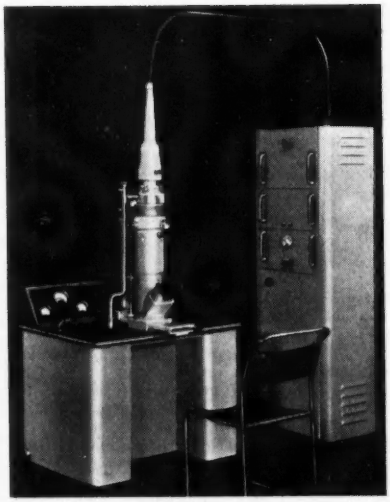
Among the balances were aperiodic 100 gm., semi-micro and micro balances by Oertling, a fully automatic aperiodic 100 gm. and a micro balance by Stanton Instruments, Ltd., and a semi-micro by W. J. George & Becker, Ltd.

Neat glass thermostat baths formed the main item on the Gallenkamp stand, together with a photo-electric colorimeter, very easily operated, and the EVT viscometer.

Baird & Tatlock (London), Ltd., made up their exhibit on one of their new all-metal laboratory benches, and Townson & Mercer, Ltd., showed the new electric ovens, provided with forced air circulation, and very close temperature control; some units of their new S.200 thermostat bath which will maintain a constancy of temperature ±.001°C.; the all-metal vacuum desiccator, and larger sizes of polythene weighing bottles.

Vacuum equipment was exhibited by Metropolitan-Vickers and by W. Edwards & Co., the latter showing the new vacuum and compressed air pump specially designed for chemists' use.

A new viscometer, having replaceable standardised capillary tubes disposed horizontally, and capable of very simple and rapid operation, was shown by Techne (Cambridge), Ltd., and centrifuges and microtomes, formed the main items in the M.S.E. exhibit; one of the latter is capable of taking the section of an entire human lung.



One of the most elaborate and promising instruments exhibited in London last week, the Metropoliton-Vickers electron microscope, which employs three magnetic lenses. It makes possible continuously variable magnification from x 500 to x 100,000

Standards for Laboratory Glassware

The Supreme Commission for Normalisation in the Netherlands has established Commission 75, charged with the standardisation of laboratory glassware. The increasing importance of the manufacture of laboratory glassware in the Netherlands has directed a great deal of interest to the activities of this commission.

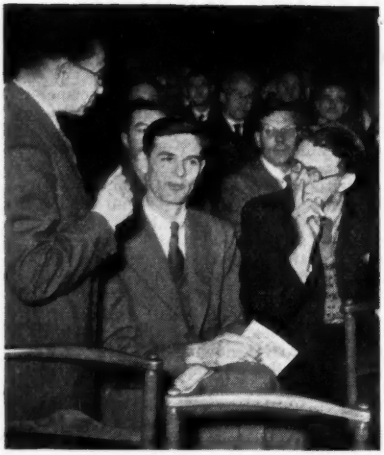
It is also reported that the first international meeting of the International Standards Organisation, commission 48 (scientific glassware and related laboratory apparatus) for which the British Standards Institution has the secretariat, is to take place this year in London. The Central Normalisation Bureau, Lange Houtstraat, 13A, The Hague, is performing the secretarial work for the newly established Dutch Commission

Municipal Research.—At an informal conference, recently, it was agreed that the Glasgow Corporation Planning Committee should prepare a memorandum setting forth their ideas of the constitution and purposes of a municipal research department for circulation among industrial interests in the area, who would be invited to submit their observations on the scheme.

CHEMISTRY OF THE HEAVY ELEMENTS

International Exchanges at Oxford and Harwell

From a Special Correspondent



Dr. M. Hassinsky (University of Paris) has a lively exchange with (right) Dr. A. G. Maddock (Cambridge University), while, between them, Prof. R. E. Connick (University of California) wears a look of impartiality

AS part of the anniversary meetings of the Chemical Society, a symposium on the chemistry of the heavy elements was held in Oxford from March 28 to March 30. This conference, organised on behalf of the Chemical Society and the Atomic Energy Research Establishment by the Chemistry Division of AERE, was noteworthy for its international character. The speakers included leading authorities from the U.S.A., Canada, Germany, France and Austria, as well as many from this country.

In a short account it must suffice to discuss only a few of the more important subjects dealt with. A full account of the papers communicated will appear in a forthcoming issue of the *Journal of the Chemical Society*.

Transuranium Elements

It was apparent from the papers of Prof. R. E. Connick, of California, and Prof. M. Haissinsky, of Paris, that there is some difference of opinion as to the exact status of the transuranium elements in the periodic system. These elements form stable compounds and exist in aqueous solution in a variety of oxidation states; thus, neptunium and plutonium, like uranium, occur in the $+3$, $+4$, $+5$ and $+6$ states, americium has $+2$, $+3$ and $+5$ states, while curium has only a $+3$ state.

The most striking difference between the chemistry of the lanthanide (rare-earth) and actinide (*i.e.*, elements from actinium onwards) elements is this strong tendency of these latter elements to form valency states higher than three. However, by consideration of their hydration energies and ionisation potentials these higher valency states would be expected in a second rare-earth series.

The existence of many chemical and physical similarities between the two series of elements was emphasised by Prof. Connick, but a different view was taken by Prof. Haissinsky, who argued that the new knowledge of the transurium elements in no way modified the established similarities between thorium, protoactinium and uranium with the elements immediately above each in the periodic system.

On this basis, the existence of a group of "actinides" was denied, but it was felt that there is some justification for a group of "uranides," containing uranium, neptunium and plutonium, with possibly americium and curium. The general feeling of the meeting was that the correctness of either point of view must await further work.

Thorium and Protoactinium

The existence of lower valency states of thorium was demonstrated in a paper by Dr. J. S. Anderson and Mr. R. M. W. D'Eye, who described work on the preparation and properties of thorium di- and tri-iodides.

A new lower valency state of protoactinium, produced in aqueous solution, was the subject of a French communication. Protoactinium was also the subject of a paper in which it was concluded that much of the reported chemistry of the element—that based on co-precipitation experiments—has only a limited significance.

To obtain a reliable interpretation of the chemistry of this element it is necessary to study its soluble complexes. On the basis of this consideration conditions have been defined for the extraction of protoactinium as the cup-ferronate by solvent extraction. This method is not only of value in the separation of this element from others but

provides a useful method of recovering protoactinium from glass vessels.

The Emanation Method

Much interest was apparent in the so-called Emanation Method which was described by Prof. O Hahn, the discoverer of nuclear fission. In this method a radium salt is incorporated homogeneously in the substance under investigation, and changes in the chemical or physical nature of the substance can then be studied by observing the rate of release of radon. Many examples of the use of this technique were described and its essential simplicity and elegance make a strong impression.

Uranium

The nature of uranyl salts in aqueous solution was dealt with in a number of papers, and the various workers using different methods of approach were in essential agreement on the formulæ of the species present in solution. Dr. Glueckauf and his co-workers at AERE in a paper on the activity coefficient of uranyl nitrate in the presence of other nitrates, described a new method for the investigation of activity of individual solutes in mixed solution. This method, which is simple to carry out, depends on equilibrium with a second liquid or solid phase.

A further paper from AERE described the results of investigations on phase equilibria in the uranium-oxygen system between the composition limits UO_2 and $UO_{2\cdot3}$, both with regard to the structure of the phases formed and the kinetics of their formation. Dr.



Two of the principal figures in nuclear physics and chemistry in the U.K., Sir John Cockcroft and Dr. H. Seligman with (centre) Dr. B. Goldschmidt (France)

H. A. Wilhelm, of Iowa State College, reported recent work on the carbides of uranium and thorium. Contrary to statements in the literature, the only definite carbides of uranium are UC and UC_2, the



Four of the foreign authorities at Oxford: E. Berne and R. Lindner (Sweden), Dr. F. Strassmann and Prof. O. Hahn (Germany)



Dr. O. Hahn

so-called sesquicarbide being a solid solution of the two.

In a paper from the Chemical Research Laboratory, Teddington, a simple method was described for the detection and determination of uranium, which has proved useful in the analysis of low-grade minerals and ores. The process depends on the selective extraction of uranium as uranyl nitrate by an organic solvent containing aqueous nitric acid, and is carried out on a strip of absorbent paper. By this means the uranium is separated from a large number of other elements and can then be determined by conventional methods.

Radioactive Tracers

One session was devoted to the preparation of radioactive tracers and another to their nuclear aspects. Methods of chemical and physical separation of radioactive isotopes produced from pile irradiation were discussed and other papers dealt with the use of the cyclotron for the production of such isotopes.

The micro-synthesis of C-14 labelled compounds of the highest possible specific activity was described.

In this work 10-20 micromoles of radiocarbon dioxide can be converted into acetylene, ethylene, ethyl iodide and ethyl magnesium iodide, the latter substance being an intermediate for the synthesis of compounds of high biological potency.

Visit to Harwell

A memorable aspect of the conference was the visit paid to the AERE at Harwell, where some of the special equipment, facilities and techniques were shown.

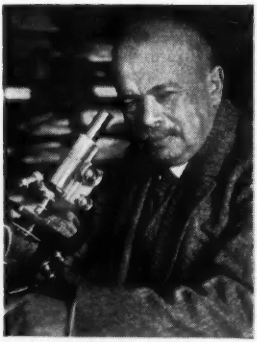
The visit to the radiochemical laboratory showed the very difficult chemical and chemical engineering problems involved in the construction of such "hot" laboratories. When uranium metal is placed in a pile, the element plutonium is produced as well as radioactive forms of at least 30 elements—the fission products.

The radioactivity and the toxicity of plutonium require extreme precautions to protect the health of the chemists who separate these various substances. It is similarly necessary to ensure that each workroom can be separated from the rest of the building and to provide facilities for the "decontamination" of the scientists and special detectors of radioactivity transmitted to their clothes and persons.

In the radiochemical laboratory all ordinary work will be carried out in well-ventilated fume cupboards, and the ventilation system, the ducts of which occupy the whole of the upper floor of the building, is one of the most impressive sights at Harwell.

In the physical chemical section a laboratory was visited in which fundamental work on ion exchange processes is being carried out with a view to relating physico-chemical data with behaviour in a chromotographic column.

This work is of importance in many fields —for the separation of fission products or isotopes, for analysis, in medical research and in the determination of physico-chemical constants. The need for experiments of long duration has led to the development of a new apparatus in which variables such as counting rate (concentration), flow rate and *p*H are measured and recorded automatically.



Dr. Fritz Strassmann

The final impression imparted by the conference was one of a vast programme of research on the chemistry of the heavy elements being systematically carried out, a programme which will necessitate the rewriting of many chapters of present-day text-books.

ABSORBENT EARTHS

Recent Developments in the Industry

THE absorbent earth industry and some recent developments achieved were described in some detail in a paper read at the Centre de Perfectionnement Technique, in 1948, by Dr. A. Ackermann. (*Chim. et Ind.* 1994, *61*, 29-37). A brief historical survey is followed by some account of the different types of earth used and their chemical composition—English, German, American, and French; also some Japanese and North African. The French samples include the following :—

	Attapulgites (Carpentras) Per cent	Sepiolites (Salinelles) Per cent	Apt earths Per cent
Silica	55-60	52	42-45
Alumina and iron ...	10	7 (Fe_2O_3 5-6)	20-28
Magnesia	2	17	2
Lime	10	1	10
Loss on heating ...	10-22	22	—

The North African earths, although highly effective in the natural state, are admirably adapted for activation. Generally it may be said that some earths increase in bleaching properties by moderate heating, but decrease at higher temperatures; others require complete roasting; and others again are apt to deteriorate upon even moderate heating or drying. They may thus be classified roughly according to loss of weight by progressive heating, as shown by the curves given in the paper for different types of earth.

Acid Treatment

Another index of quality is provided by response to acid treatment, either sulphuric acid or, more commonly, hydrochloric, with or without further treatment with strong alkali (caustic soda). In order that an earth may be capable of activation, the percentage of alumina and ferric oxide removed by acid treatment (HCl) in the German method should be 16-18 per cent. Despite the new knowledge acquired from recent research, especially on the structure of clays, it is still necessary to depend largely on empirical methods of test, *i.e.*, to determine the actual bleaching power in practical experiments.

It must also be emphasised that it is seldom possible to secure from one source or deposit all the qualities required, so that careful blending of earths of different types is often necessary, needing close collaboration between mineralogist, chemist, and engineer.

The various forms of mining or other recovery methods, principles of acid treatment, grinding, etc., are indicated; also determination of density, and the different methods and instruments employed for estimating bleaching power, including those of Lovibond, Hellige and others, with comparators, photo-electric cells, etc. The use of standards is explained. The main characteristics in a bleaching earth specification are, apparent acidity, fineness, oil retention, heat of wetting, and pH.

In an interesting section of his paper devoted to the behaviour of earth during bleaching, Dr. Ackermann points out the difference between acting in mixture or suspension and by percolation or use of filter beds. Temperature in any case plays an important part, and some crude earths can be heated up to 400° C. without adverse effect; activated earths are, of course, more sensitive to thermal conditions. In most cases, however, except sometimes with mineral oils, the temperature should not exceed 150° C. or thereabouts.

Bleaching

It must be remembered that in bleaching, the agent acts almost or entirely as an absorbent without chemical action of any kind. The matter retained or absorbed by the earth is for the most part organic and usually of low ash content, so that attempts have been made to regenerate the earth by extraction and possibly also incineration; but most of such attempts have been, it is thought, abandoned. However, any oil retained by the absorbent earth is often worth recovering.

In dealing with edible oils, it used to be the common practice to choose a bleaching earth according to the oil to be treated, and in America fullers' earth was often the agent chosen; but the technique has changed somewhat now. Bleaching power and price are the main considerations.

Refining

The various preliminary operations in refining are briefly listed, and the actual bleaching process described. The requisite amount of earth finely powdered is added to the oil which has been gently warmed or heated, stirred vigorously, and the temperature raised somewhat for 10 to 30 minutes. The used earth is removed by filtering, any oil retained on it being recovered in various ways.

The oil may next be heated in vacuum or blown with superheated steam in order further to deodorise it, subjected to acid treatment, and then de-acidified by washing. In many cases carbon may be used as supplementary bleaching and deodorising agent.

Limiting Effects of Air Pollution

British and American Experience Discussed

BRITISH and American observations of the causes and limitation of industrial air pollution presented several comparatively new aspects at the recent 115th national meeting in San Francisco of the American Chemical Society. The British contribution, by Dr. S. H. Richards, of the Fuel Research Station, London, was concerned with the results of observations over a period of three years at Leicester.

At High Levels

He noted that, contrary to what was commonly believed, "surface" winds played comparatively little part in carrying away smoke; no great accumulation of smoke could be detected in surface air blowing across Leicester.

The conclusion to be drawn was that the smoke tended to spread quickly upwards, after which it was blown away horizontally by the stronger winds in the upper air. This accounted for the greatest concentrations of smoke in the surface air always being found near the city centre.

It was also noted that atmospheric turbulence was usually greatest in the middle of the day, when the sun was high, as well as in clear, windy weather. This meant that daytime ordinarily was best for carrying out any operations, such as soot blowing, which involved the production of suspended impurities near the ground. Unfortunately, operations of this kind were frequently conducted at night, when the turbulence was low.

The Supersonic Principle

Some of the possibilities of removing smoke and dust suspensions by powerful sound and supersonic waves were discussed by Dr. H. W. St. Clair, of the U.S. Bureau of Mines. Vibrations of 5000 to 50,000 per second could be used to remove air-borne solids and, while the most effective range for agglomeration was in the audible band (up to 18,000), the frequency could be so attenuated as to produce no objectionable noise.

Recently, high frequency sirens had been developed that had an output equivalent to several kW. of electric energy. These powerful new sound generators, and possibly others yet to be developed, opened the way for practical utilisation of the effect on an industrial scale.

The effect of super-powered sound had been carefully analysed by passing the waves through glass tubes filled with smoke of various types, fogs of oil and water, quartz dust, and other common air pollutants. It had been observed that the contaminating particles formed "wafers" which were suspended in mid-air at intervals equal to one-half the wave-length of the sound, the time for agglomeration varying from a few seconds to 10 or 15, depending upon the individual size and the concentration of the particles.

It was probably not widely known that sound waves exerted a pressure against an obstacle in their path. At high intensities, however, such as those attained in sonic agglomeration, the pressure was great enough to be felt distinctly against one's hand.

Lead Airborne

It had been possible to support lead shot by a sound field set up between a reflecting plant and an electromagnetic vibrator. Sound of this intensity would exert a pressure of several grammes per square centimetre against the reflector.

A complex array of forces combined to drive individual particles together, the first theory to explain sonic agglomeration attributing the effect to the increased rate of collision resulting from the accelerated movement of the particles. Other forces similar to the phenomena which explained the trajectory curve of a baseball were also involved, concluded Dr. St. Clair.

CHEMICALS FROM HOLLAND

(From Our Special Correspondent)

UNDER the trade agreement recently concluded between Britain and Holland, covering an aggregate mutual turnover of upwards of £60 million in the year 1949, Holland is to furnish a large number of chemical and kindred materials. The bulk of the items will be subject to special licences from the Dutch Government. Quinine alkaloids and salts are to be delivered to Britain to the amount of £100,000.

Among the items not requiring any individual licence are essential oils, aromatic chemicals (to a value of £150,000), synthetic resins, pressed powders, softeners for paints and plastics, and hormone and vitamin preparations.

Supplementary materials, to the total value of £17½ million, to be delivered by Holland, that will come up for consideration include superphosphates. Among the other relatively major items are viscose sponges, ferro-cyanides, and magnesite.

NEW ULTRASONIC GENERATOR

Developing Use as a Laboratory Tool

ULTRASONIC air waves have been found to have uses which may be divided into three main headings: agitation, chemical change, and killing of bacteria. What is claimed to be the first commercial generator of these waves for the purposes named has now been put on the market by Mullard Electronic Products, Ltd. It is the Mullard ultrasonic generator, designed to fulfil the need for an experimental unit of wide flexibility.

It is emphasised that this is a laboratory tool for the use of research workers in industry to whose products and processes the science of ultrasonics has special application, and that the Mullard Company has confirmed the results claimed only in the laboratory and on the restricted scale applicable therein.

The company is offering the instrument to industry as a tool to be further developed in the light of factory requirements and the recommendations arising from practical experience of its use.

The generator has been used for the cleansing of fabric immersed in water, the ultrasonic beam agitating the fabric, from which the dirt is precipitated. It has been found that smoke and fog in cinemas can be cleared by projecting an ultrasonic beam along the light path from the cinema projector. A representative of THE CHEMICAL AGE was told by an executive of the Mullard Company that this might have the effect of smothering the audience with smuts, precipitated by the beam, indicating the need for further experimentation, probably on the lines of an extractor fan and the supplying of conditioned air.

Under the heading of agitation, the successful emulsification of liquids has been achieved, and it has been found, for example, that a smoother consistency of chocolate and paint mixtures can be secured. Oil and water can be emulsified.

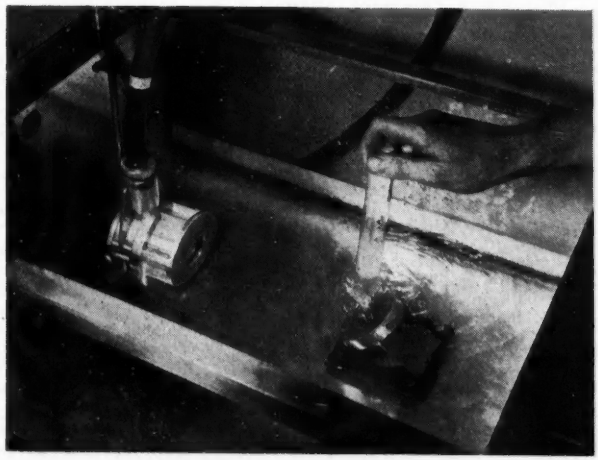
Accelerating Reactions

It is borne in mind that by this means certain chemical reactions may be greatly accelerated and rapid separation achieved. A demonstration of this was the swift separation of iodine from an aqueous solution of potassium iodide containing carbon tetrachloride.

Experiments on whisky with the ultrasonic generator are stated to have demonstrated that the 10-year period normally needed for the maturing of the spirit may be considerably reduced.

It has been found that various types of bacteria can be destroyed by means of ultrasonic beams, and that milk and other liquids may thus be sterilised.

The beam from the ultrasonic generator is always concentrated and, with a protective shield, no danger need be offered to human life or health. If a finger is deliberately interposed in an ultrasonic



A simple demonstration on a small scale of one separation technique, in which the sample in a test tube is immersed at the focal point between a parabolic reflector and the source, a quartz crystal in a metal casing, linked to the generator by co-axial cable

beam, a blister would almost certainly be the result. Refraction of ultrasonic beams can happen in a small way, but the safeguards are very simple.

Much effort and further research are yet required to bring ultrasonics to the point where the science may make a major contribution to the world's standard of living. It is for this reason, the Mullard Company states, that it has produced the generator in the hope that those to whom it may be most useful will assist in developing the early promise of ultrasonics to practical fulfilment.

Present Design

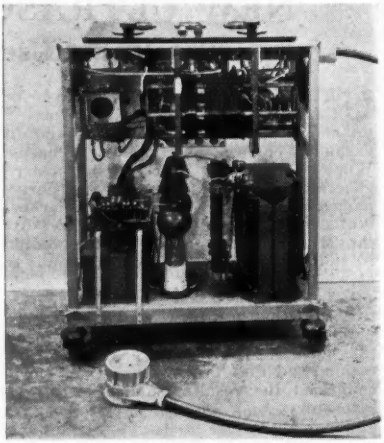
The instrument on which the present project is principally based is the Mullard ultrasonic generator, (Type E1562), comprising a control panel with meters, power oscillator, output voltmeter, relay panel and power supply. It is mounted in a tubular frame. Trolley wheels are provided for ease of transport and the cover is adequately ventilated.

The radio frequency output is generated directly by a silica triode capable of producing 1 kW of RF power. Four plug-in coil assemblies, which are rapidly interchangeable, are provided for operation around nominal frequencies of ¼, ½, 1 and 2 mc/s.

The valve is matched to the crystal impedance by tapping the anode down the coil in the output circuit. Fine tuning of the output circuit and adjustment of grid coupling are effected by means of variometers. The oscillator is housed in the upper portion of the frame with the control panel immediately above. On the lower deck is the power supply comprising two grid-controlled mercury vapour rectifiers, the filament transformer and the HT transformer.

The quartz crystal is contained in a metal case, and is connected to the generator by means of a co-axial cable. The crystal has silver electrodes fired on both sides to which the driving voltages are applied. To give the maximum ultrasonic output in the forward direction the crystal is air backed.

The limitations on the temperature at which the transducer can work are set by the polythene of the cable and the rubber sealing rings. If silastic rubber is used and the back of the holder is adequately cooled, the crystal can safely be immersed in liquids at temperatures up to at least 150°.



Photos. by courtesy of Mullard Electronic Products, Ltd.

Although the ultrasonic generator is the first commercial model, intended to undergo development, the compactness of this mobile unit will not easily be bettered. Here is the whole equipment, the generator, with panels removed, and the metal-cased crystal resonator

Leak Testing in 13 Miles of Tubing

OF interest to chemical engineers is a formidable testing operation recently carried out at Schenectady research laboratories of the General Electric Company, designed to detect leaks, even of infinitesmally small proportions, in 13 miles of special copper tubing. This, of 0.12 in. diameter with 0.015 in. wall, induction brazed in 100 ft. lengths, is to be used as a water-cooled conductor in a vacuum chamber

A mixture of eight parts of nitrogen to one part of freon was bled into the tubing, while the far end remained open, until samples of the escaping gas were found to contain freon, as shown by the G.E.C. type H. leak detector. A valve was then closed and the pressure built up to 600 lb. p.s.i. The preliminary bleeding of the air was necessary to prevent the tubing at the far end of the coil from retaining only air. Excepting for about 5 ft. at the ends of the coils, which were tested by hand, the actual leak test was conducted by running the tubing through a special pick-up at about one foot per second, using a motor-driven winding drum. In the first test seven leaky joints (out of 675), two porous sections of tubing, and three folds were found. The leaky joints were due to poor brazing; the porous sections were 100-ft. coils that had many leaks per foot over the entire length.

THE FIELD FOR NYLON

I.C.I. Summarises Current Applications

A DEMONSTRATION of the diversity of uses to which nylon lends itself was given on Monday at the Plastics Division of Imperial Chemical Industries, Ltd., Welwyn, Herts.

Nylon, because of its strength, durability, inertness to chemical attack and ease of sterilisation, is well qualified for use in applications in many fields of industry. Welwyn is the centre of research and development of I.C.I. nylon products.

Known Since 1930

A brief survey of the history of nylon was given by Mr. Morgan Jones, manager of the technical service and development department, who recalled that the term was applied to a group of synthetic fibre-forming materials first discovered by the E.I. du Pont de Nemours Co. Inc., U.S.A., in 1930, but it was eight years later before it was available on the market. The first British plant was erected by I.C.I. and came into operation in 1941, and during the war years mainly produced nylon ropes, monofilms for surgical sutures, tooth brushes, etc.

Tapered Filaments

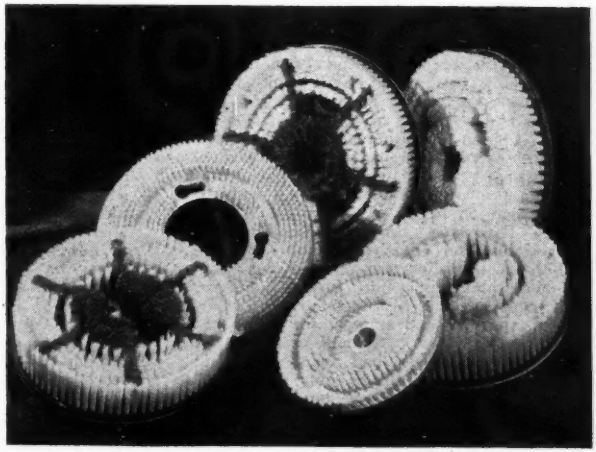
The main present industrial use of nylon was for bristles in a wide range of brushes, from hair and tooth brushes to large glass washing brushes with a polythene stock. After considerable research, a method of tapering nylon monfilaments had been evolved and paint and distemper brushes with excellent painting characteristics and a much longer life than ordinary bristle had been evolved.

The future of nylon in industry, however, probably lay in injection moulding, the production of lock nuts, bearings and small mechanical parts. One aspect of particular interest was the use in textile spinning of nylon injection moulding for pickerhammers, which were formerly made of raw hide.

There were a number of interesting exhibits displayed to illustrate the points of the talk, ranging from fishing lines and fishing casts, tennis racquets, mouldings and combs to wigs. One special type of nylon was a transparent film for surgical dressings, having the unusual characteristic of being sufficiently permeable to water vapour to prevent the skin becoming sodden, while it was proof against moisture and micro-organisms from outside and the transparency enables the wound to be inspected.

Insulation

A tour of the works followed and demonstrations were given for the comparison of nylon and bristle paint brushes, the extrusion of nylon to form a sheath on wire, injection moulding, and the production of a brush—from the cutting and polishing of the Perspex base to the stapling of the nylon bristles.



Nylon's serviceable characteristics in the construction of heavy duty scouring tools is exemplified in this range of brushes for use with power drives. All employ the durable monofilaments in the place of the conventional bristles

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BRITISH CHEMICAL PLANT

Encouraging Report of Manufacturers' Association

A FURTHER advance in the number and range of the services it provides for members was recorded in the report of the executive committee for 1948, presented at the annual general meeting, in London last week, of the British Chemical Plant Manufacturers' Association.

The report recorded that since the last annual general meeting the membership had increased from 98 to 100, which still did not fully represent the numerical strength of the industry.

It was proposed to invite specialist suppliers to the industry to become associate members to increase the strength of the association and its value as a meeting ground.

Equipping the Home Industry

The association had been able to persuade the Government that it would best serve the national interest if it employed its main resources to equip the home chemical and allied industries to enable them to fulfil their onerous and important export targets, rather than to export too much chemical plant and so build up overseas chemical industries to compete with our own. There needed, however, to be discrimination between the urgent and essential requirements of the home user industries and those which might have to be curtailed during the emergency period.

Chemical Plant Panel

It was therefore agreed with the Government that an informal chemical plant panel representative of the Ministry of Supply, the Board of Trade, and on occasions the Ministry of Fuel and Power and other ministries concerned, together with the director and secretary of the Association of British Chemical Manufacturers and of the BCPMA, should meet periodically to review the position and to consider approved contracts and projects and the way in which their execution might be expedited. Conversely the panel provided a medium for ascertaining and advising members of the BCPMA which important projects were for the time being put into suspense. Similarly, the panel assisted in securing departmental approval and support for members' own urgent capital equipment programmes.

This informal panel had been an invaluable means of canalising the supply of chemical plant to approved home projects.

The association had been in frequent consultation with the Government both regarding general import licensing policy and specific import licence applications. While the national interest from time to time required the import of plant unobtainable in the United Kingdom or which could not be supplied in time for urgent needs, the association was accustomed to confer with appropriate members before giving its opinion to the Government and has been able to divert to members orders that would otherwise have been placed with overseas suppliers.

The Government had set up a Cabinet sub-committee to survey means of achieving a greater economy in the use of steel. The association had met the sub-committee or its representatives on several occasions and had satisfied its members that the chemical plant industry was fully alive to the importance of economising in the use of steel. The committee was particularly impressed with the value of the industry's contribution to the proposed new BSI pressure vessel code and the economy that will result from its full adoption.

Productivity Teams

The association was investigating the possibility of taking advantage of the arrangements made under the Anglo-American Joint Council on Productivity to send productivity teams to the U.S.A. to study American methods.

The association had continued to take an active interest in the education and training of chemical engineers and had appointed an education committee to review existing chemical engineering facilities, and to recommend for the consideration of the executive committee proposals for discussion with the appropriate authorities and institutions. Proposals which had been made in connection with the establishment of national and higher national certificate courses in chemical engineering were receiving the attention of the association.

The association proposed to collate from members information on accidents on which plant design, layout or method of operation may have had some bearing. While the anonymity of the firms concerned would be preserved, it was desirable that such information should be made available to the industry so that lessons from a given accident might be learned by all likely to be concerned with similar plant or operations.

Discussing the part to be played by chemical plant in further reducing the overseas trade deficit, the committee notes that

the chemical plant industry had to play its direct part in the export drive, and a large part of the association's time and energy was directed to promoting overseas trade, especially to hard currency areas, of individual members and of the industry as a whole.

It is impossible accurately to assess the industry's total exports, for much of the equipment that is shipped is a combination of items which are entered in the Government returns under other headings, but exports under "Gas and Chemical Plant" rose from £0.99 million in 1947 to £2.19 million in 1948.

One of the markets being opened, the committee's report reveals, is that of Argentina and other South American countries, of which the director had made a personal investigation. His contacts and subsequent report were leading to a substantial increase in the export of chemical plant to those important markets.

Throughout the year the association had received visits from many overseas buyers, who had been directed to appropriate members, and had dealt with an increasing number of export inquiries, which had either been notified in the fortnightly bulletin or circulated to members interested.

Prior to the war, the association organised exhibitions of chemical plant once in every five years. During the period that immediately followed the war the unprecedented demand for chemical plant made such an exhibition undesirable because of the additional load which it would have thrown on members' already heavily burdened staffs. The opinion now was that the time might be ripe by 1950 to hold such an exhibition and that further exhibitions should not be held at shorter intervals than four or five years.

Discussions had also been proceeding with the ABCM regarding the possibility of holding a joint chemical/chemical plant exhibition within the next two or three years.

New members appointed to the council of the association in place of several removed by retirement and other causes, were confirmed as follows: Messrs. J. Bishop, E. Smyth and R. F. Stewart.

The BCPMA Luncheon

CLOSE collaboration between the Association and Government Departments—"the maximum support with the minimum of interference"—and the success of the corporate drive for overseas orders for chemical plant were stressed by Mr. A. G. Grant, chairman, at the annual luncheon of the British Chemical Plant Manufacturers' Association in London last week. He warmly acknowledged the moral and practical support given by the Board of Trade to the recent trade mission of 12 to Canada, of whom five were members of the BCPMA, and the leadership of Sir Harry Gilpin, chairman of the British Food Machinery Manufacturers' Association, which had done much to improve commercial relations between the two countries.

Their association was concerned primarily with chemical plant. Their first allegiance was to true chemical industry. But the science of their business defined a far wider world than the true chemical production. The layman knew civil, mechanical and electrical engineering. There had grown up a fourth great engineering group—chemical engineering—in which the process was greater than the plant. That was where the three other engineering groups became handmaidens of physical and chemical processes, as, for instance, the catalytic cracking of oil.

In Canada and the U.S.A. he had sensed a wider conception of the chemical process industries than obtained in this country. There they had no trade associations representing the individual sections of the industry, but in their literature, practice, and above all their thinking, their people regarded the true chemical industry as embracing in one whole the manufacturing of such things as oil, gas, sugar, and paper. There he sensed a feeling of really united industry, a unity of plants and processes rather than a lot of separate industries.

In this country, the chairman continued, the parent of them all was the Federation of British Industries. They had formed a very high opinion of that federation and admired its very fine statesmanship.

If the BCPMA and its members were to exist in to-day's circumstances, there would have to be a sustained effort on everybody's part to strengthen their trade association, and so also strengthen the FBI.

Returning to chemical engineering, Mr. Grant said that they in their association were the practitioners and behind them were the men of science. He was glad to welcome several professors of chemical engineering, whom he assured of the association's support and appreciation of the professors' work of achieving in the chemical engineering courses a high academic level. They were particularly pleased that the status of the chemical engineering training in the universities should have been made a high one, and usually an "honours" one.

(Continued at foot of next page)

Scottish Graduates and Industry

"Too Many Go South"

SCOTLAND is not employing the number of graduates in science and engineering necessary to ensure the maintenance of progress in a scientific age, said Sir Steven Bilsland, at a meeting of the directors of the Glasgow Chamber of Commerce. "I hope that Scottish industry will give progressively more attention to this matter," he said, "for we cannot afford to export brains at the current rate."

Sir Steven, speaking as a member of the Glasgow University appointments committee, drew attention to what he described as the valuable service that organisation performed in providing contact between industrial firms and others with appointments to offer and students seeking employment after graduation.

The work of the appointments organisation during the past year had been recently reviewed at the annual meeting of the committee. In 1948 the committee received notification of more than 2000 vacancies for which a university training was a necessary qualification.

"I was disturbed to note from the report," said Sir Steven Bilsland, "that English industrial firms greatly predominated over Scottish firms in sending representatives to interview students about to graduate. This tendency is reflected in the most recent figures covering the employment of graduates in industry. At present the number of qualified men of degree or equivalent standard directly employed in industry in the United Kingdom is between 10,000 and 12,000. Of this number, 500 are employed in Scotland—less than one-twentieth of the whole."

It was arguable that it would be difficult for Scotland to employ its full 10 per cent (which would be its proportion relative to population) because there were fewer very large industrial organisations in Scotland. But, of their 500 graduates, 200 were employed in one industrial organisation alone.

The research associations to-day employed about 1000 graduates, only 15 of them being at work in Scotland. This was due to the policy hitherto adopted of concentrating research institutions in the South—a policy reversed in relation to the mechanical engineering science laboratory at East Kilbride.

On the other side of the picture, he continued, the number of undergraduates in engineering, relative to the population, was twice as great in Scotland as it was in England. In science—including physics and chemistry—it was one-and-a-half times as great in Scotland as in England.

THE BCPMA LUNCHEON

(*Continued from previous page*)

Another subject he wished to touch upon was research. Up to now, there had been no organised co-operative plant research in chemical engineering, but if this were ever to be provided, he thought they could not do better than take a leaf out of the book of the Gas Research Board, represented that day by Dr. H. Hollings, and see how that body handled co-operative research.

The response to the toast of "The Guests" was given by Mr. H. W. Cremer, president of the Institution of Chemical Engineers, who said that, speaking as one who had spent some 20 years in academic life, he believed the finest gift that could be bestowed on the profession of chemical engineering was the personal presence of members of the BCPMA among the young men who were training for it. This sort of thing was the lifeblood of chemical engineering, and the student was not slow to realise it.

He appealed to his hearers not to think that their obligation to the student of chemical engineering was sufficiently met by giving him permission to visit some works or plant. They must try to get among the students, and so help their picture of the profession and industry to became coloured instead of remaining plain and purely academic. They would not be regarded as interlopers.

Mr. Grant had referred to the lack of organised co-operative plant research. The speaker was able to report that important steps were now being taken by the Department of Scientific and Industrial Research to rectify the omission. It would be premature at this stage to say more.

He had always considered that chemical engineering was in general even more concerned with applied physics than with applied chemistry, and he thought that great strides had been made in recent years in awakening in the minds of physicists the realisation that the chemical engineers needed them, and that they needed the chemical engineers. They had before them a great and glorious opportunity of making chemical engineering one of the finest cultural experiences.

Personal



Mr. George Taylor, newly appointed president of the Society of Public Analysts



Sir Clive Baillieu, new chairman of the Dunlop Rubber Company

MR. NEIL J. MACLEAN has retired from the managing directorship of Barr & Stroud, Ltd., scientific instrument and apparatus manufacturers, Anniesland, Glasgow, after 45 years' service with the firm. A native of Greenock, Mr. Maclean graduated B.Sc. in engineering at Glasgow University, and, after spending a year on the teaching staff there, joined Barr & Stroud, Ltd., as manager of the factory. Seven years ago he was appointed managing director.

MR. JAMES HAMILTON, manager of the raw materials supply department of the Port Sunlight works of Lever Bros., Port Sunlight, Ltd., has retired. On March 31, he received from Mr. J. P. Sinclair, one of the directors, a presentation from his colleagues in recognition of his 30 years' service with the company. Mr. Hamilton organised the first bulk shipments of soya beans and palm oil to Port Sunlight.

DR. W. HUME-ROTHERY, F.R.S., at the annual general meeting of tthe Institute of Metals last week, was presented with the institute's platinum medal for 1949 in recognition of his outstanding contribution to the science of non-ferrous metallurgy. The medal has been awarded for the past 12 years in appreciation of academic, industrial or technical achievements.

MR. W. H. TAM, chief industrial gas engineer of the Severn Valley Gas Corporation and Gas Consolidation, Ltd., and formerly with the Liverpool Gas Company, has been appointed development engineer of the Wales Gas Board.

SIR GEORGE BEHARRELL has resigned from the chairmanship of the Dunlop Rubber Company and is succeeded by SIR CLIVE BAILLIEU, who has been deputy chairman since 1945. SIR GEORGE BEHARRELL becomes president of the company and remains on the board. MR. G. E. BEHARRELL, managing director, continues in that office on becoming deputy chairman. MR. J. H. LORD appointed to the Board in 1947, takes the title of director of finance.

MR. C. L. SMITH, Dunlop's new general advertising manager, has been appointed chairman of the advertising committee of the Tyre Manufacturers' Conference in succession to Mr. Harold Eley who has retired.

MR. W. A. KINNEAR, a director of Evans Medical Supplies, Ltd., has been adopted as a candidate in the forthcoming City of Liverpool municipal elections.

MR. TREVOR LEWIS has been awarded the John S. Owens prize by the Council of the Royal Sanitary Institute for an essay on atmospheric pollution.

MR. LEONARD P. O'BRIEN has been elected chairman of The Fullers' Earth Union, Ltd., in place of the late SIR BERTRAM T. RUMBLE, who died on January 12.

LORD BOYD-ORR, formerly Director-General of the United Nations Food and Agriculture Organisation, was made an honorary fellow of the Royal College of Physicians of Ireland.

MR. WILLIAM EDWARD HAWTHORNE, of Wolverhampton, a director and secretary of the Cannon Iron Foundries, Ltd., Bilston, left £74,027, with net personalty £72,219.

Parliamentary Topics

Raw Materials Controls. In a written reply to Mr. W. S. Shepherd, the president of the Board of Trade (Mr. J. H. Wilson) gave a list, which included the following chemical articles, setting out (a) the goods which require a licence for trade or manufacture; (b) the materials purchased for resale on Government account; (c) the materials which cannot be acquired without licence. He made it clear that the list did not include import licensing or any non-statutory arrangement for the allocation of materials.

(a) Cotton linters; jute yarn and goods; lactic acid and casein; paint; sulphuric acid.
(b) Basic slag; calcium carbide; casein (lactic and rennet); Chile nitrates; cynamide; raw jute; jute yarn and goods; mollasses; ethyl alcohol, butyl alcohol, acetic acid and anhydride; phosphate rock and superphosphates; potash, carbonate of potash, and caustic potash; sulphur and pyrites.
(c) Bristles (for brush making); *cotton linters; raw jute; jute yarn; new jute goods; linseed oil; molasses; ethyl alcohol; butyl alcohol; acetic acid and anhydride.
* Open licences in place of quantitative licences as announced on March 22.

Non-Ferrous Metal Production.—In reply to a question by Mr. Douglas Marshall—if the Minister of Supply, when appointing advisers on non-ferrous metal production, would include some who are technical experts in Cornish tin mining—Mr. G. R. Strauss gave his assurance that he would appoint people "best equipped for the job."

Streptomycin.—The Minister of Health, (Mr. Aneurin Bevan) replying to a question by Mr. Granville Sharp, said: Production of streptomycin is now sufficient to cover all medical needs for which the use of the drug is reliably indicated and to provide small but increasing quantities for export. Further expansion is planned. Since July, 1948, the number of hospitals in England and wales where streptomycin treatment is available has been increased from 30 to 200.

Castor Beans and Oil.—Replying to Sir John Barlow, the Parliamentary Secretary to the Ministry of Food (Dr. Edith Summerskill) said it was not in the public interest to disclose information about our purchase prices or stocks of castor beans and oil. Our present selling prices were £142 and £135 per ton, according to quality.

Chemical Engineering Research

The need for research in chemical engineering was discussed at the last meeting of the advisory council of the DSIR.

It was agreed to appoint a committee under the chairmanship of Mr. H. W. Cremer to review the needs for research in the field of chemical engineering and the extent to which they can be met by existing research establishments.

Obituary

DR. FRIEDRICH K. R. BERGIUS, the world renowned German chemist, has died at Buenos Aires, aged 65. He was professor of the Technical High School of Hanover and devoted most of his time to research at his private laboratory. The outstanding result of his scientific work was the invention of the process for transformation of coal into oil and later the process for production of sugar from wood. He shared the Nobel prize for chemistry in 1931 and also possessed the Liebig, Melchett, Esener Medal. He was direcor of several companies of oil, sugar and alcohol industries in Germany and abroad. Among his numerous publications are the following English ones: The Transformation of Coal into Oil by means of Hydrogenation (1926); Contributions to Knowledge of the Transformation of Cellulose and Lignin into Coal (1928); Recent Development in the Reduction of Coal, Oil and the Chemistry of Wood (1928); Conversion of Wood to Carbohydrates and Problems in the Industrial Use of Concentrated Hydrochloric Acid (1937). He was an honorary member of a great number of scientific societies and institutions in Germany and other countries.

DR. WILLIARD H. DOW, president of the Dow Chemical Company, and his wife and three others were killed when his plane crashed while he was travelling to Boston to hear Mr. Winston Churchill's speech. Dr. Dow, who was 58, started his career as a chemical engineer of the firm, and in 1930 became president and general manager of the Dow Company and of the affiliated Cliffs Dow Chemical Company, Dowell Inc., Ethyl Dow Chemical Co., Jo-Dow Chemical Co., and Midland Ammonia Company. He was a member of the advisory board of the leading U.S. chemical institutions and societies.

Polands Rising Coal Exports

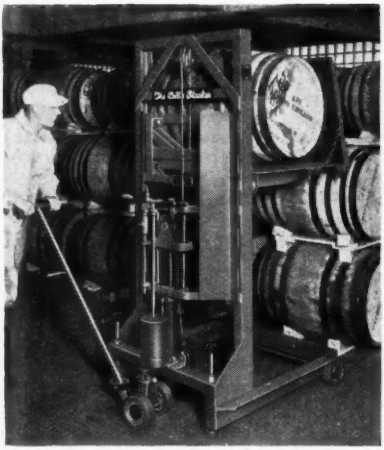
Poland exported last year some 25 million tons of coal out of a total output of roughly 70 million tons, according to an official statement. The figure exceeded estimates by about 2.5 million tons, the target. Shipments to Northern Europe are estimated at 7.5 million tons and 5 million tons went to Central Europe. Exports to Western Europe totalled 4 million tons, 65 per cent more than in 1947. Shipments to East Europe at 7 million tons, were 1 per cent lower than in 1947. It is estimated that Russia received 6.5 million tons. The Government has issued a denial of the report that Russia was paying only the equivalent of about 6s. per ton, compared with world market prices of around £5 per ton.

Technical Publications

THE deterioration of textiles, leather and other organic materials through mildew and rot is a major problem not only in the tropics but in many parts of the world. A summary of information gathered by the National Bureau of Standards (United States Department of Commerce), over a period of years has now been published in a booklet "Microbiological Deterioration of Organic Materials: Its Prevention and Methods of Test.' Miscellaneous Publication No. 188). The booklet, with 18 illustrations, is in two sections, the first dealing with the cause and prevention of mildew damage, and the second covering investigation of microbiological test.

* * *

Heat- and corrosion-resisting alloys are the subject of a large proportion of the abstracts in the January/February issue of *The Nickel Bulletin* (Vol. 22, Nos. 1-2) published by the Mond Nickel Co., Ltd. Other articles cover electrodeposition and other coating methods, and there is an interesting feature on the application of nickel-chromium steel for bone fixation in orthopædic surgery. The publication has 35 pages and reverts to colour in the cover for the first time since the war.



Designed to economise in time, manpower, and costs, this 5 cwt. stacker has a loading ramp for handling barrels, a table 30×36 in., with lifting height of 60 in. It is one of several illustrated in the new catalogue of J. Collis & Sons, Ltd., London and Barry

The wide range of repairs which it is possible to carry out on broken and worn industrial machinery, machine tools and engine parts by scientific welding is described in a fully-illustrated booklet just issued by Barimar, Ltd.

* * *

The Manufacturing Chemists' Association has published the Chemical Safety Data Sheet SD-31 on acrylonitrile, being the 31st of its series of chemical product safety manuals. It affords for supervisory staffs and management, essential information for the safe handling and use of the chemical, and outlines its important physical properties. Health hazards are also discussed. (The Manufacturing Chemists' Association, 246 Woodward Building, Washington 5, D.C., U.S.A.—1s. (20 cents)).

* * *

Considerable advances have taken place since the publication in 1938 of "The Science of Petroleum," the standard work, in four volumes. The Oxford University Press now has in preparation further volumes, which will record these advances. These will bring the four already published up-to-date, and will appear whenever the accumulation of new knowledge warrants it. The new volumes have been planned provisionally, to be issued in parts. Volume V will deal with the chemistry, physics, and chemical engineering of petroleum and will be edited by A. E. Dunstan, formerly chief chemist of the Anglo-Iranian Oil Company, and by B. T. Brooks, consulting chemist in New York City. Volume VI will cover the geology, geophysics, production and distribution of petroleum, and is being edited by Prof. V. C. Illing, of London, and J. R. Suman, of New York.

* * *

Microscopic work requires reagents of a known purity and the use of proper dyes is of great importance. The standard stains prepared by British Drug Houses, Ltd., have been surveyed in a booklet with notes on the methods of using them. This is a revised edition, with new matter and an index.

* * *

Technical progress, both in the manufacture and application of paint, is reflected by two bibliographies issued by the Paints Division of I.C.I., Ltd. These publications, "Literature on Paint, Varnish and Lacquer Technology" and "Literature on the Technique of Paint Application," were originally produced for the training of the firm's technical staff, but are now available on application to all students or practitioners.

British Association Meeting

THE 111th annual meeting of the British Association for the Advancement of Science will be held in Newcastle-upon-Tyne from August 31 to September 7 under the presidency of Sir John Russell.

The inaugural general meeting will take place in the City Hall on the evening of Wednesday, August 31, when the association will be welcomed by the Lord Mayor, and Sir John Russell will give his presidential address on "World Food and World Population."

The section meetings will be held at Kings' College, at which the following are among the subjects preliminarily announced:—

Thursday, Sept. 1.—Soil Physics and Ultrasonics; presidential address by Sir Alfred Egerton: The Influence of Studies in Combustion on the Progress of Chemistry; the Propagation of Flame; New Materials and the Engineering Significance; presidential address by Prof. Lily Newton on The Utilisation of Marine Algæ; presidential address by Prof. N. M. Comber: Farming, Science and Education.

Friday, Sept. 2.—The Nitrogen Cycle in Nature; presidential address by Prof. L. Dudley Stamp: Planning of Land Use.

Monday, Sept. 5.—Fundamental Particles and Radio-astrophysics; Fluorine: the Element and some of its Newer Compounds; the Combustion of Carbon; River Pollution; presidental address by Sir Arthur Fleming: Bridging the Gap between Science and Industry; Electronics.

Tuesday, Sept. 6.—Geophysics and New Developments in Interferometry; Chemistry and the Food Supply; Radiochemistry. (Afternoon visit to Durham.)

Wednesday, Sept. 7.—New Optical Methods for Studying Micro-structures; Folic Acid and Anæmia.

Two evening discourses will be given to members in the hall of the Literary and Philosophical Society, Westgate Road, on Friday, September 2, and Monday, September 5. One of these will be on "Exploration of the Ocean Floor," by Dr. Hans Pettersson, leader of the Swedish Deep-Sea Expedition.

A number of excursions, visits and social functions have also been arranged.

A full programme giving detailed arrangements will be published about August 10.

Flexible Packaging Materials.—Over 60 firms will be demonstrating at the exhibition of flexible commercial packs and packaging materials to be held in the hall of the Council of Industrial Design, Murray House, Petty France, London, S.W.1, from May 3-31. Three new processes will be shown publicly for the first time in this country. One overcomes the difficulty of fixing durable designs and lettering on PVC film; another prevents corrosion inside a sealed pack; the third is a means of manufacturing jute sacks by a circular loom.

Next Week's Events

MONDAY, APRIL 11.

Institue of Packaging (Northern Branch). Manchester: Grand Hotel, 6.0 p.m. Dr. G. L. Riddell: "Package Testing."

TUESDAY, APRIL 12

Society of Chemical Industry (Plastics Group). London: 26 Portland Place, W.1, 5.30 p.m. H. W. Thorp: "Chemical tetrafluorethylene." (Chemical Engineering Group) London: Burlington House, W.1, 5.30 p.m. H. W. Thorp: "Chemical Engineering Problems in the Sea-Water Magnesia Process."

Society of Instrument Technology. Manchester: College of Technology, 7.30 p.m. D. O. Walter: "Some Metals and Alloys for the Instrument Designer."

Hull Chemical and Engineering Society. Hull: Church Institute, Albion, Street, 7.30 p.m. Annual general meeting.

WEDNESDAY, APRIL 13

Society of Chemical Industry (Food Group). London: Royal Sanitary Institute, 90 Buckingham Palace Road, S.W.1. 6.30 p.m. Eighteenth annual general meeting. Dr. E. B. Hughes: "Some Thoughts on the Food Group."

Institute of Fuel. Manchester: Annual general meeting and exhibition of films, 2.0 p.m. Luncheon 1.0 p.m.

Institute of Welding (North London Branch). London: Polytechnic, Regent Street, W.1, 7.30 p.m. Annual general meeting.

FRIDAY, APRIL 15

Society of Dyers and Colourists. Manchester: Gas Department Showrooms, 6.30 p.m. Annual general meeting and lecture.

Meeting Postponed

The meeting of the North West branch of the Institution of Chemical Engineers, previously announced to take place at the College of Technology, Manchester, to-day, (Saturday), has been postponed. The paper by Mr. C. B. Cox on "Counter-Current Fat Splitting by the Twichell Process" will be given instead at the next meeting on Saturday, April 30.

Students' Prizes.—By the generosity of a number of Merseyside firms of industrial chemists, chemical students at Liverpool Technical College will continue for the next 15 years to receive annual prizes worth £15. The fund, which had hitherto supplied the annual prizes, had become exhausted.

Home News Items

London Office.—A London office has been opened by A. B. Metal Products, Ltd., at Ludgate House, 107 Fleet Street, E.C.4. (Central 5667.)

More Room for Chemical Equipment.—Brush Hanger is being converted into an extension to Loughborough College, Leics., for chemical engineering studies at an estimated cost of £10,000.

Pharmacists' Visit.—A large party of chief pharmacists from London hospitals were the guests of Evans Medical Supplies, Ltd., during a two-day visit to the company's laboratories and factories, at Speke, Liverpool, on March 31 and April 1. The chairman, Mr. I. V. L. Fergusson, presided over a dinner party for the guests at the Adelphi Hotel.

Tuberculosis Vaccination.—Particulars of the scheme to try out tuberculosis vaccination in the United Kingdom were given last week by the Edinburgh Medical Officer of Health. People in specified groups will be asked to consent to vaccination with B.C.G. vaccine (Bacillus Calmett Guerin). This vaccine is thought to be effective as a preventative.

Student Aid.—The Power-Gas Corporation, Ltd., Stockton-on-Tees, has endowed an open scholarship at Durham University for a course of study, leading to a degree, in either civil or mechanical engineering. It will be tenable for three years or, in exceptional cases, four. In 1937, the corporation endowed an open scholarship at the University of Leeds for gas, chemical, mechanical or civil engineering.

Threat to Salt Works.—The possibility that the Salt Works at Lymm, Cheshire, of Charles Moore and Co., Ltd., will have to be closed has been raised by subsidence around the works, which has caused cracks in floors and slight damage to roofs. The workers, all but a handful of whom are men, have formed a committee to discuss possibilities with the management. The plant has been in use since 1903.

Tiles from Slate Dust.—The factory to produce floor tiles, certain types of which will combine slate dust from Welsh quarries, is to be opened at Portmadoc. Disused wharf buildings in the harbour area will be taken over and arrangements made to transport the slate dust from a Penygroes quarry. The factory, which in the initial stages will employ 40 men and women, will in due course produce enamel walling tiles and other products.

£600,000 Plant Increase.—New extensions rolling mills at Falkirk, planned for the British Aluminium Co., Ltd., are estimated to cost £600,000.

Visits to Germany.—Under changed regulations affecting business visits to any of the three Allied zones in Germany, letters of sponsorship from the Board of Trade are no longer required (as from April 1) and authorisation of currency exchange by a bank will be required before military permits are issued.

Engineering Apprenticeship.—Boys leaving school have been invited by Mr. F. M. Bless, labour manager of Timpell, Ltd., of Heysham, to visit the factory, inspect working conditions and "quiz" the officials, preparatory to taking up employment as indentured apprentices for five years in a number of trades, including those of instrument artificers, mechanical engineers and welders.

Uranium and Thorium in Kent?—Further light on the presence of radio-active minerals in Kent is afforded by the report that uranium and thorium have been found in Scaler's Hill Colliery, Rochester, Kent. The ore was discovered by Mr. Thomas Wallis, a Welsh mining engineer, who settled in the locality. Since the mine was opened last June, 1,000 tons of coal and lignite have been taken from it.

Scottish Research.—A grant of more than a quarter of a million pounds to Prof. Dee of Glasgow to assist him in the construction of a synchroton for research in nuclear physics, has been described by Dr. H. Buckley as an example of the benefits derived by the Scottish Universities from the Department of Scientific and Industrial Research. The doctor was addressing members of the Royal Scottish Society of Arts in Edinburgh last week on the increasing part being played by the Scottish section of the D.S.I.R. in research developments.

One Quarter's Coal Output.—Total coal production in Britain last week was the highest since December 18, and opencast output the highest since July 3. Comparative figures are: Last week: 4,337,100 tons (deep-mined 4,104,400 tons, opencast 272,700 tons). Previous week: 4,288,900 tons (deep-mined 4,048,600 tons, opencast 240,300 tons). Figures for the first 13 weeks of the year are given as 55,409,400 tons compared with 52,394,000 tons last year. Then, however, the Easter holiday intervened, causing a reduction of possibly 1 million tons.

Palestine Potash

Maximum Production with U.S. Aid

From Our Own Correspondent

INACTIVE for almost a year as a result of the hostilities in the country, the Palestine Potash Company is preparing to resume production at the Dead Sea as soon as the Israel-Transjordan armistice is signed. This was disclosed by Mr. Robert Szold, a director of the company, who is completing a month's tour of Israel.

Royalties Payable

He said that royalties would be paid to the Governments of Israel and Transjordan. In 1930, the Palestine Potash Company obtained a 75-year concession to develop and exploit the Dead Sea minerals from the British Mandatory Government. The plant at the southern end of the Dead Sea is in Israel territory and is undamaged. It yields 70,000 tons annually. There were one or two skirmishes in the area early in the fighting but no serious clashes developed and the plant was only once under shell fire.

A New York engineering firm, the Chemical Construction Corporation, has been engaged by the concessionaires to lay out a programme for the maximum development of the Dead Sea raw materials.

Meanwhile, the emergency caretaker management of the Consolidated Refineries, Ltd., Haifa, appointed by the company last year on the British withdrawal, has completed its task and has handed over to the British management. The refineries are expected to begin operating again at the beginning of May.

The overhauling of the power house is now completed and overhaul of the entire installation has begun, a process which will take at least six weeks.

Labour Conditions

An indication of the nature of industrial labour conditions in Israel is afforded by the demands made by the Haifa Labour Council to the Consolidated Refineries, similar to the scales required at other oil undertakings. These require 14s. per day basic pay for unskilled labour; £1 7s. for skilled men, and for all salaried staff, including clerks, technical personnel and heads of departments, from £16 to £65 basic pay per month.

A skeleton staff of 300, including mechanics and repairmen, has been working at the plant since the beginning of the year. A workers committee has been interviewing former employees, Arabs and Jews, who wish to be re-employed and the Israel army has agreed to release a number of key men required by the company.

French Colonial Chemicals

A Diversity of Production

THE French Union is the scene of considerable industrialisation programmes. In Indo-China, a governmental organisation is studying the question, and one of the first objectives is the utilisation of phosphate seams at Laokay.

In Algeria, the Société Solvay et Cie has installed equipment which will enable 3000 tons of chloride and sulphur to be produced. The Laboratories d'Etudes Minières have been equipped to produce 1000 tons of zinc oxide from the Ain-Arko mines. Treatment of fullers' earth is being undertaken by the Compagnie d'Exploitation et de Chimie Appliquée, which expects to produce 20,000 tons of derived products, and the Ets. Caraboux is treating chalk for pharmaceutical purposes.

One hundred tons of finished products, fatty acids and derivatives, is the capacity of the Sté. Africaine des Applications Chimiques, while up to 150 tons of glue and gelatine is produced by the Laboratoires d'Exploitation des Procédés Berchof.

Water-repelling Products

The Sté. Chimique et Routière d'Algerie is installing equipment in all the large centres of Algeria to produce water-repelling products. Trituration will reach 36,000 tons exclusive of 2500 tons of tar annually. A factory has been equipped at Bakari to produce 6000 tons of insecticides, and pharmaceutical products and 450,000 litres of chloride water are produced by the Sté. Algerienne de Produits d'Electrolyse. The Sté. des Peintures Astral, specialising in the manufacture of paint, varnish, synthetic enamels, etc., has a capacity for 3000 tons, and the Ets. F. Norel produces 200 tons of resins and 1200 tons of various paints.

Sogechim, one of the most important firms in the Belgian Congo, is producing 35,000 tons of sulphuric acid a year. The Union Chimique Afrique produces paint, varnish and wax, Congolina has increased quinine production to 1000 tons per annum, and the Union Minière electrolyses water for oxygen.

French Uranium-Ore Resources.—M. Dautry, the Government delegate of the French Atomic Energy Commissariat, expressed recently an optimistic view on the uranium-ore discoveries at St. Sylvestrè in the Haute Vienne Department. These, he said, were richer than any other deposits worked in France, though their extent was not yet known. He thought it probable that France would prove, at least, self-sufficient as regards uranium.

INDIA EXCLUDES SODA ASH

Imports of Caustic Soda to Continue

From Our Own Correspondent

THE difficulty of sustaining payment in dollars and hard currencies has obliged the Indian Government to exclude imports of soda ash for the time being. The duration of this regulation is not yet defined, but the stock position of soda ash in India will be reviewed from time to time so that necessary imports may be allowed whenever the stocks in the country are found to be insufficient to meet the needs of the consuming industries.

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Dr. S. P. Mukherjee, Indian Minister of Industry and Supply, inaugurating the 15th annual conference of the All-India Soap Makers' Association, in New Delhi, recently, expressed satisfaction at the fact that the soap industry in India was the only one which was able to produce not only all the requirements of the country, but was also in a position to export its surplus goods. He said that the production of medicated soap, however, did not meet the requirements of the country and he urged soap manufacturers to devote their attention to this. Referring to the difficulties of getting raw materials for soap production in India, Dr. Mukherjee said it was rather unfortunate that they had still to depend upon foreign imports for the total quantity of caustic soda which they required. The Government, however, was fully alive to the matter, and schemes for the production of caustic soda in India were being prepared. There were 4000 small cottage soap industries in India and it was desirable that they should be helped by big industries to raise their standard of production.

If the Soap Makers' Association wanted to establish a research institute and would put forward a specific plan, the Government would be glad to subsidise the scheme, said Dr. Mukherjee, who emphasised the need for further improvement in the quality of soaps manufactured in India.

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Referring to the by-products of the soap industry, Dr. Mukherjee said there was a greater possibility of manufacturing glycerine. At present the production of this in India was only 800 tons. There was a great demand for refined glycerine, and if efforts were made to check the waste they could produce more of it for India's own consumption as well as earn valuable foreign exchange through its export to dollar areas.

Mr. K. M. Anita, outgoing president of the association, appealed to the Government to liberalise export restrictions; about 40,600 tons of soap could be made available for export. He also urged on the Government the necessity of not allowing foreign capital to be invested in soap manufacture in India.

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A new variety of motor spirit derived from vegetable products is stated to have been discovered at Goom, about four miles from Darjeeling, India. Under instructions from the Government a sample of the new spirit had been sent to the Government Technical Development Laboratory at Kanpur for test and experiment.

The Minister of Industries, Government of Madras, Mr. H. Sitarama Reddi, stated, in reply to a question in the Madras Assembly, that the Government of India had approved the establishment of three distilleries for the manufacture of power alcohol a Vayuru, Vizagapatam and Nellikuppam. The establishment of another factory at Hospet was under discussion.

The setting up of plants to manufacture power alcohol, said Mr. Sitarama, was subject to the approval of the Government of India, which aimed at a target of 20 million gallons of power alcohol per annum. Of this about 145,000 gallons were to be manufactured in Madras Province. The sugar factories chosen were those of the Vizagapatam Commercial Corporation, Ltd., the K.C.P., Ltd., Vayyuru, and Parry & Co., Nellikuppam, each to produce 100,000 gallons.

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A call to Indian manufacturers of superphosphates to make concerted efforts for increased production to supply artificial manure to the primary producers at the lowest economic price, was made in Bombay by Mr. G. L. Mehta, president of the Indian Tariff Board. Opening the inquiry into the prices of superphosphates, Mr. Mehta said that increased production would make an effective contribution to the stepping up of food production and reducing food grain prices, as well as conserving valuable foreign exchange.

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Experiments on the possibilities of producing camphor from the Tulsi plant are being carried out at the Industrial Research Laboratory, Kasuali, East Punjab. If the experiments prove successful, they will mean a saving of lakhs of rupees to India as camphor is now an expensive import.

Overseas News Items

Air Mail to Palestine.—Registered correspondence may now be sent by air and surface routes to the Israeli-controlled area of Palestine and to certain Arab-controlled places.

U.S. Aluminium Record.—The U.S. domestic production of primary aluminium for 1948 was 623,483 tons, an increase of 9 per cent above the 571,750 tons produced in 1947, and established 1948 as the record year for peacetime aluminium production.

Russia Seeks Barter With Ceylon.—The Russian commercial attaché in Calcutta (Mr. V. A. Vasilieu) is stated in Colombo to be attempting to effect a barter agreement with Ceylon, to acquire from the island tea and rubber. Ceylon is already receiving sulphate of ammonia from Russia.

Swiss Chemical Firm's Activities.—Ciba, Ltd., Basle, chemical and pharmaceutical company report a net profit for 1948 of Swiss francs 14,119,734 as compared with 14,973,232 in 1947. The Ciba Foundation for scientific, medical and technical research is to be allocated one million Swiss francs, while a new benevolent foundation for social welfare receives some three million Swiss francs.

ECA Quinine Needs.—The Economic Co-operation Administration has announced the purchase for the U.S.A. stockpile of strategic materials, of $278,000 worth of quinidine sulphate, quinine derivative, from the N.V. Bureau Voor Den Kinineverkoop in Amsterdam. Fulfilment of the order which will be carried out by the Netherlandse Kinifabrick, N.V. will require the processing of about 200 tons of cinchona bark and will take about six months to complete.

Netherlands-Italy Chemical Trade.—A recent trade agreement between the Netherlands and Italy, provides for the export, by Italy of the following chemical products: etheric oils and citrus essences (Fl.1,000,000), various chemical and pharmaceutical products (ea. Fl.1,500,000), sulphur (1000 tons), baryte (Fl.300,000), raw celluloid (Fl.800,000), aniline dyes (Fl.1,000,000). Holland is to ship *inter alia* benzole for industrial purposes (50,000 tons), various chemicals, including oxalic acid, gelatine for photographic purposes and azo and diazo compounds (Fl.800,000), opium and cocaine and its derivatives (Fl.100,000) and pharmaceuticals (Fl.1,000,000) of which insulin (Fl.150,000) and opotherapeutical specialities (Fl.650,000).

Swiss Aluminium.—Industrie A.G., Chippis, reports a net profit for last year of Swiss francs 7,596,109 (6,400,171 in 1947). The dividend remains unchanged.

Brazil's Record Mineral Yields.—The following figures have been published showing the output of five of the main basic industrial and mineral products in Brazil during 1948: pig iron, 532,394 metric tons (480,638 tons in 1947); steel, 481,114 tons (388,024); coal, 2,013,284 tons (1,995,878); cement, 1,111,503 tons (913,525). These, with the exception of coal, are the largest totals ever recorded.

Spanish Metals and Minerals

More Steel and Aluminium

ACCORDING to a recent statement by the Spanish Minister of Industry and Commerce, the iron and steel foundry planned at Marises, near Valencia, will be put into operation this year, and it is also planned to start production of an aluminium plant at Valladolid.

Initial output of the latter will be about 1250 tons of aluminium-ingots anually, but the plant is eventually expected to reach a capacity of 10,000 tons. In conjunction with this a factory is now being erected at San Jose de Nieva in Oviedo for the production of alumina. Imported bauxite will be used at first, but later will be replaced by the home mined product; this factory will also manufacture magnesium ingots for alloys.

ITALIAN MINERALS

THE following figures for estimated production in 1948 and 1953 of the principal Italian minerals have been issued by the Ministry of Industry and Commerce:—

	(Thousand Tons) 1948	1953
Bauxite	110	220
Iron ores	400	800
Manganese and ferro-manganese ores	45	50
Lead ores	52	67
Zinc ores	123	170
Ferruginous zinc ores	36	40
Pyrites	784	1,000
Asbestos	12	20
Barytes	60	120
Fluorine ores	40	60
Felspar	13	25
Talc	60	75
Graphite	7	10
Asphaltic rock	220	220
Rock salt	600	800
Kaolin	25	80
Antimony	0.28	0.32
Crude sulphur	180	250
Slab marble	160	250

Advancing Production Technique in South Africa

Exploitation of Local Raw Materials

From Our Own Correspondent

A CONSIDERABLE lessening of South Africa's dependence upon the United Kingdom and the U.S.A. in some specialised chemical treatments of colour and other photographic film, and later probably in technology, is expected to result from the extensions now being built at Kodak laboratories in Doornfontein, Johannesburg, which it is stated will provide processing facilities second only to those available in America. These extensions anticipate great industrial and domestic development of the Union and the new plant will increase by more than 100 per cent present facilities for colour films and by over 300 per cent services for black and white films. It is claimed the equipment will be of a more advanced design than Britain's. The new laboratories will serve the whole of Africa, as far north as Egypt. Hitherto, all 35 mm. colour film was sent either to London or America for processing and much of the black and white ciné film is sent to overseas countries.

* * *

The importance of sodium bisulphite to the Union's export fruit industry, as a means of arresting maturing processes, has been widely recognised as a result of observations during the last fruit season. The use of this chemical as a spray applied to the wood-wool packing of grapes, producing a heavily gas-laden atmosphere, has fully proved the efficacy of this treatment, with the result that the greater part of the crop for inland markets this year and much more of the export fruit than formerly has been gassed. Special machinery has been installed at some of the leading packhouses to enable the protection to be given on the farms during the present grape season, which will soon be reaching its peak. Grapes packed in this way retain all their pristine freshness and the stalks remain green.

* * *

The embargo on imports of expensive toilet soaps under the new South African Customs arrangements has resulted in a "run" on soap in general, according to an official statement and spokesmen of the soap industry. There are, in fact, no grounds to anticipate a shortage of any type of toilet soap. The South African soap industry gets its palm oil from the Belgian Congo, coconut oil from the Philippine Islands and Lourenço Marques. It uses its own tallow and whale oil. It is stated that the Union Government still has a surplus of whale oil. About 9000 tons were purchased after last season's catch in the Antarctic, and about 3000 tons of this will shortly be sent to Germany. Stocks are so full that, when the Union whaling fleet returns from its present expedition in the Antarctic, the whole catch will be taken by the U.K. Minister of Food.

* * *

The first shipments of imported raw materials for the local manufacture of fertilisers have been delivered, but at the moment conditions in the fertiliser industry are seasonally quiet. Most paint factories on the other hand are in full production and manufacturers report plentiful supplies of pigments and other raw materials and that the demand for paints and varnishes is keen. The production of tyres continues to be maintained at full plant capacity.

* * *

It is believed that during the current year Lever Brothers (Rhodesia), Ltd., will begin the production of margarine in its new factory at Salisbury. Margarine, made in Durban, is now selling in Rhodesia at 2s. 3d. a lb., but the total quantity available is very small. The machinery for the Salisbury factory has still to be delivered, but when it is in action there should be sufficient margarine to meet all Rhodesian requirements. There will be a corresponding increase in by-product cattle and poultry feed.

* * *

A rapidly developing plastics and chemical industry is being built up by Poly-Resin Products, Ltd., on a 16-acre site at East London, Cape Province, where new construction now being carried out aims to provide for local use alkyl and other resins for high-gloss paints, emulsions for distemper bases, and for treating different grades of leather and hides. Since September the company has been making synthetic resins for local manufacturers and these seem to have supplied a large part of the demand for varnishes, paints and lacquers, and for wood adhesives, insulation and impregnating resins. Opportunities are being sought to exploit more of the promising raw materials in the country and to widen the scope for using various types of chemicals made in the factory.

Coal Tar Research

NCB Represented in New Association

THE Coal Tar Research Association was registered on March 29 as a company limited by guarantee, without share capital, the word "limited" being omitted from the title by licence of the Board of Trade. The original number of members is 750, each being liable for £5 in the event of winding up. The objects are stated to be: To take over all or any of the assets and liabilities of the unincorporated Coal Tar Research Association.

The first members of the council are: Dr. E. V. Evans (president), managing director of the South Metropolitan Gas Co.; Mr. S. Billborough (vice-president), vice-chairman and managing director of Yorkshire Tar Distillers, Ltd., director of the National Benzole Co., Ltd., director of Synthetic Chemicals, Ltd., and director of the Creosote Producers' Association, Ltd.; Mr. R. B. Robinson, director of Midland Tar Distillers, Ltd., and six others nominated by the Association of Tar Distillers; Mr. D. Jackson and two others nominated by the British Association of Coke Oven Tar Producers; Col. W. M. Carr and two others nominated by the British Gas Council; and Mr. D. Hicks and two others nominated by the National Coal Board.

Solicitors are Radcliffes & Co., 10, Little College Street, London, S.W.1, and the registered office is at 9, Harley Street, London, W.1.

CATTLE FEED REPLACES SOAP

IT was decided recently, in negotiations between the directors of Ogston & Tennant's soap factory, Renfrew, and the directors of their associated company, the British Oil & Cake Mills, Ltd., that the St. Rollox Works at Renfrew should cease to manufacture soap in June of this year, and that thereafter the British Oil & Cake Mills, Ltd., should take over the factory and convert it for the eventual manufacture of cattle, pig and poultry foods. The BOMC manufacturing capacity in Scotland in existing mills is not considered sufficient to meet the estimated increased demand for animal feeding stuffs during the next few years. The larger proportion of the animal feeding stuffs trade in Scotland prior to 1939 was taken up by sales of straight cake —linseed and cotton—to the Scottish farmers, who used cotton cake in the summer to counteract the laxative effect of grass, and linseed cake in winter when the beasts were off the pasture.

Plastics Film

Structural Control

"THE Nature of Plastics," a 16 mm. sound and colour film sponsored by Bakelite, Ltd., was shown to the Press this week at the British Council Theatre in London. It is not confined to plastics made by Bakelite, Ltd., but considers plastics as a group of materials, explains what they all have in common, how they are built up and why they differ from natural materials.

One of the principal lessons of the film demonstrates how structure plays an all-important part in all the organic materials, including plastics. It is shown how the same types of atoms, arranged in different patterns, can give sugar, acid or a pungent gas, and how the chemist can control the packing of pattern chains to make plastics which behave like rubber or convert them into a fibre. All these points on the molecular structure of plastics materials are made clear by means of large-scale models and animated diagrams.

Examples are shown of how plastics are increasing in productivity and some of their many everyday uses are also considered. It is pointed out that plastics offer a combination of properties not possessed by any other group of materials, but that their principal contribution to industry and to life generally is made in association with the older materials, such as wood, brick, stone and metals, rather than in competition with

BORAX CONTROL RELAXED

AMPLIFYING the statement made by the President of the Board of Trade in the House of Commons on March 22, the Board of Trade announces that allocations of borax and boracic acid made to individual consumers under the direction of the Board of Trade ceased on April 1 and ordinary trading conditions are, in general, established. The amount of borax which may be used in the manufacture of sodium perborate is, however, still limited, and is subject to agreement between the Board of Trade and the suppliers. The total supplies for other uses will continue to be watched, as hard currency imports are involved and economical standards of use should still be observed. As from May 1, the Board will be prepared to consider applications for import licences.

Implementing the U.S. proposals for assisting ECA countries for developing mineral and other resources in undeveloped areas, the ECA has formed a colonial development division of which DR. ISAIAH BOWMAN, former president of the John Hopkins University, will be the principal.

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

DORAN INSTRUMENT CO., LTD., Stroud. (M., 9/4/49.) February 22, debenture, to Barclays Bank, Ltd., securing all moneys due or to become due to the bank; general charge. *——. April 7, 1948.

PEST CONTROL, LTD. (formerly PEST CONTROL HOLDINGS, LTD.), Bourn. (M.,9/4/49.) February 7, three mortgages (sec. 97, 1948 Act), to Hambros Bank, Ltd., each securing all moneys due or to become due to the bank; charged on property and land at Hauxton (Cambs.), with plant, machinery, etc. (*see* Satisfactions).

PLASTIC & METAL PRODUCTS (BRIGHTON), LTD., Portslade. (M., 9/4/49.) February 17, series of £10,000 debentures, present issue £7000 general charge. *Nil. March 14, 1948.

Satisfactions

PEST CONTROL, LTD. (formerly PEST CONTROL HOLDINGS, LTD.), Bourn. (M.S., 9/4/49.) Satisfactions February 8, of three mortgages registered February 7, 1949.

PORTLAND PLASTICS, LTD., London, S.W. (M.S., 9/4/49.) Satisfactions February 26, of undertaking to create a debenture registered September 8, 1947, and of debenture registered January 13, 1948.

Company News

The name of Commercial Structures, Ltd., Staffa Road, Leyton, London, E.10, has been changed to **Chamberlain Industries, Ltd.**

The address of **G. H. Smoker,** laboratory engineer, has been changed to 71 County Street, New Kent Road, S.E.1.

Chemical and Allied Stocks and Shares

STOCK markets have been dominated by Budget influences. Earlier in the week, gains in industrial shares were well held, while British Funds strengthened on the view that prices in this section may well go higher later in the year under the influence of the important conversion operations falling due.

The lower base metal prices resulting from the decline in lead and zinc in the U.S.A. were expected, and had little influence on share values.

Chemical and kindred shares have been firm, Imperial Chemical continuing to change hands at around 45s. 3d., while Monsanto Chemical 5s. ordinary were firm at 57s. 6d. in anticipation of the full results and chairman's annual statement. Fisons have been active around 52s. 9d., and Bowman Chemical 4s. shares were 7s., with Brotherton 10s. shares 20s. 3d.

Albright & Wilson were again 29s. 9d., Amber Chemical 2s. shares 8s., and Boake Roberts 5s. ordinary 30s. 6d. Sanitas Trust 10s. ordinary were 25s. 9d., and among preference shares British Chemical & Biologicals 4 per cents changed hands around 20s. 9d., with L. B. Halliday 4½ per cents near 22s. 4½d.

Awaiting the results, William Blythe 3s. shares have transferred up to 21s. There was a sharp rise to £22¼ in Glaxo Laboratories earlier in the week. British Drug Houses were 8s., and British Glues & Chemicals 4s. ordinary 18s.

The higher price of aluminium strengthened British Aluminium shares to 47s. 6d. The 4s. units of the Distillers Co. rose to 28s. 3d. Turner & Newall were also better at 78s., with United Molasses 44s. 6d.

Triplex Glass strengthened to 22s., and British Oxygen at 99s. 4½d. firmed up in anticipation of the financial results expected later in the month. The latter may also give news of the company's plans for raising fresh capital. Many leading industrial companies require money to purchase more equipment so as to increase output and cut production costs, and they have been awaiting the Budget before finalising their plans.

Boots Drug shares moved up to 54s. 3d., and in other directions General Refractories rose to 24s. in response to the full results, which confirm the raising of the dividend from 10 per cent to 12½ per cent and the profit increase shown by the preliminary statement. Shares of companies connected with plastics were mostly better, with British Xylonite at £5, and British Industrial Plastics 2s. shares 5s. 9d., while De La Rue rose to 37s. 9d.

Iron and steels moved narrowly, Thomas & Baldwins at 15s., and United Steels at 29s. 9d. were easier among shares of companies scheduled for nationalisation. Else-

where, Babcock & Wilcox, after reacting, firmed up to 66s. Staveley were 83s. 9d., and T. W. Ward 63s. 9d., with Tube Investments at slightly under £6¼. Powell Duffryn changed hands around 28s. 3d.

British Match rose sharply to 33s. 9d., and Beechams deferred rallied to 16s. 3d., but Sangers turned easier at 32s. 1½d. Associated Cement have fluctuated rather sharply around 79s. 6d., although the market is assuming that there are possibilities of the forthcoming report announcing a higher distribution. The question of nationalisation of cement and of any other nationalisation schemes will not arise for the present, and will, in fact, be determined by the result of the next general election.

Oil shares lost further ground on the trend of oil prices in the U.S.A. and talk of a price war between the big American groups. Shell declined to 63s. 1¼d., and Anglo-Iranian to £8¼. A sharp rise to 72s. 6d. earlier in the week in C. C. Wakefield was attributed to the possibility that the Budget might bring a reduction in the heavy oil duty.

British Chemical Prices

Market Reports

MANCHESTER.—Traders on the Manchester chemical market have had little cause for complaint during the past week regarding the volume of new inquiry for regular supplies or the amount of actual business that has been placed over a fairly wide range of products. Home trade users of the alkalis and other leading heavy products are calling for steady deliveries against existing orders and there is a good movement of supplies on export account. Steady or firm price conditions are again reported in most sections of the market. Among the tar products, cresylic acid is quieter, but carbolic and creosote oil, as well as most of the light distillates, are meeting with a steady demand.

GLASGOW.—In the Scottish chemical market conditions have again been static. There is a gradually increasing demand for whiting in various grades as certain new industries established during the last few months are now getting into full production. There has also been an increase in the demand for pigments and certain chemicals. In general, however, the industries which have been established in Scotland call for little in the way of chemical supplies. The supply position has shown no change and prices have remained stable. In the export market conditions have been a little quieter, although a good turnover has been maintained.

Scottish Fertiliser Expansion

£71,000 Building Scheme

PLANS submitted by Scottish Agricultural Industries, Ltd., were recently approved by the Ayr Town Council to permit the construction of new buildings for the storage of manufactured fertilisers at a cost of £71,000. This is part of a project to set up at Ayr the largest fertiliser unit in Scotland, for which £29,000 will be spent on plant. The new stores will have high capacity electric cranes and other machinery designed to mechanise bagging and permit a turnover of 40 tons of material per hour. They will service the granulation plant recently installed.

First of its type in Scotland, the plant will serve primarily the Scottish area, but it is hoped that distribution will also be expanded in due course to the other areas of the British Isles.

The Board of Trade has given its approval to the scheme, in view of its importance in stimulating production in agriculture, and it is hoped that construction will begin on April 1.

Ceylon's Cinnamon

The Government of Ceylon is considering the abolition of the "fair price" system for the sale of cinnamon and allowing free trade in this commodity. The Fair Price Board for cinnamon, consisting of dealers and shippers, is expected to meet the Minister of Commerce and Trade, Mr. H. W. Amarasuriya, shortly and discuss the question. In the meantime, considerable confusion is being caused among overseas buyers by certain shippers quoting less than the prices fixed by the board. For the twelve months ending December, 1948, 32,546 cwt. of cinnamon quills were exported from Ceylon at a value of Rs. 3,708,676.

Mexican Guano

Previously authorised to collect, prepare, and sell natural and organic fertilisers, mainly guano, the Government-sponsored company Guanos y Fertilizantes de Mexico, U.S.A., has now been empowered to manufacture synthetic and inorganic fertilisers. Among the company's activities are a guano unit at Guadalajara, a superphosphate plant at San Luis Potosi, and an affiliated plant in Mexico City making glue and bone meal. A new nitrogenous fertiliser works partly financed by the Export-Import Bank, is to be built near Cuautitlan.

Patent Processes in Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted will be obtainable, as soon as printing arrangements permit, from the Patent Office, Southampton Buildings, London, W.C.2, at 2s. each. Higher priced photostat copies are generally available.

High-density alloy.—Callite Tungsten Corporation. Sept. 30, 1942. 617,057

Production of cast iron.—Mond Nickel Co., Ltd. Nov. 25, 1942. 617,144.

Alloy steels.—Mond Nickel Co., Ltd. April 14, 1943. 617,325.

Method of and apparatus for irradiating provitamin D.—Winthrop Chemical Co., Inc. Aug. 31, 1943. 617,414.

Method and means for heat-bodying glyceride oils of the drying and semi-drying types.—R. A. Carleton. Oct. 9, 1944. 617,151.

Chutes for the delivery of material such as coal.—Mavor & Coulson, Ltd., D. Jackson and J. Thomson. Jan. 24, 1945. 617,327.

Impregnation of absorbent materials with bituminous compositions.—Texaco Development Corporation. Feb. 29, 1944. 617,062.

Aneroid type instruments responsive to ambient gaseous pressure.—Wallace & Tiernan Products, Inc. Jan. 7, 1944. 617,063.

Heat-exchange apparatus.—G. N. Haden & Sons, Ltd., and H. H. Bruce. March 16, 1945. 617,241.

Resistance welding and testing.—British Thomson-Houston Co., Ltd. May 4, 1944. 617,415.

Methods and apparatus for making aerosols.—S. Hochberg. May 9, 1944. 617,155.

Means for controlling the electric heating of a moving continuous metallic article.—Carnegie-Illinois Steel Corporation. Oct. 12, 1944. 617,158.

Foam forming solutions.—J. A. Lewis. Sept. 14, 1945. 617,071.

Vinyl chloride and process of preparing same.—B. F. Goodrich Co. Nov. 9, 1944. 617,335.

Therapeutic preparations and methods of preparing the same.—C. E. Every (Lakeland Foundation). Oct. 25, 1945. 617,419.

Method of preparing aqueous suspensions of magnesia.—Soc. Française d'Etudes & d'Entreprises, and J. C. Seailles. Dec. 10, 1942. 617,420.

Multiple electrode arc welding.—Babcock & Wilcox Co. Dec. 22, 1944. 617,077.

Process for the extraction of wool-grease or other fatty material and soap from wool-scourers, liquors or similar trade wastes and the purification of the liquors for re-use.—J. W. McGregor & Sons, Ltd. Jan. 27, 1945. 617,250.

Method of and means for distilling sea water.—S. A. Smith, and H. C. Wilkins. Feb. 5, 1946. 617,339.

Production of corrosion resistant coatings on zinc and cadmium surfaces.—Rheem Research Products, Inc. March 21, 1945. 617,083.

Apparatus for determining the vapour content of a gas.—A. D. Little, Inc. April 25, 1945. 617,089.

Solid dimer of alpha-methyl paramethyl styrene and methods of making the same.—Standard Telephones & Cables, Ltd. March 13, 1945. 617,342.

Production of butadiene.—British Celanese, Ltd. March 20, 1945. 617,090.

Manufacture of substituted furo-imidazoles.—K. Hofmann. April 4, 1945. 617,260.

Liquid level controllers and/or indicators.—Davy & United Engineering Co., Ltd., and D. A. Love. April 23, 1946. 617,094.

Manufacture of variegated plastic sheet material.—Armstrong Cork Co. Nov. 20, 1945. 617,266.

Production of amines.—E. I. Du Pont de Nemours & Co. May 5, 1945. 617,247.

Process of and apparatus for separation of one or more metals from alloys.—Indian Standard Metal Co., Ltd., and A. Schwartz. May 17, 1946. 617,350.

Manufacture of hydrocarbon polymers.—J. C. Arnold. (Standard Oil Development Co.) May 22, 1946. 617,351.

Manufacture of fibrous materials.—British Belting & Asbestos, Ltd., and R. Drake. May 24, 1946. 617,103.

Roasting of sulphide ores.—O. Nordstrom. May 28, 1946. 617,427.

Esters of salicylic acid.—E. Lilly & Co. June 30, 1945. 617,190.

Preparation of substituted benzoic acid esters and salts thereof.—E. Lilly & Co. June 30, 1945. 617,191.

Alloys for high temperature use.—Haynes Stellite Co. June 13, 1945. 617,194.

Alloys for high temperature service.—Haynes Stellite Co. June 13, 1945. 617,195.

Vulcanisation of rubber compositions.—Wingfoot Corporation. Jan. 16, 1946. 617,273.

Treatment of fibrous materials.—R. N. C. Strain, and G. E. Patrick. July 31, 1946. 617,209.

Cast-iron welding.—Philips Lamps, Ltd. Oct. 10, 1942. 617,116.

Tetrahydro-thieno uracils and method of preparing same.—Lederle Laboratories, Inc. Aug. 10, 1945. 617,435.

Hard metal alloys.—British Thomson-Houston Co., Ltd. Aug. 6, 1945. 617,212.

Vertical retorts for the carbonisation of coal and the like.—F. J. West's Gas Improvement Co., Ltd., and E. West. Aug. 13, 1946. 617,436.

Apparatus for thinning out plants, hoeing or similarly treating land.—A. S. Edwards. Aug. 14, 1946. 617,119.

Process for producing volatile hydrocarbons from hydrocarbonaceous solids.—Universal Oil Products Co. March 18, 1944. 617,284.

Recovery of polymers from aqueous dispersions thereof.—British Celanese, Ltd. Sept. 12, 1945. 617,285.

Method of and apparatus for separating a solid material from a solid-carrying liquid.—W. W. Triggs. (V. D. Anderson Co.) Sept. 13, 1946. 617,230.

Manufacture of common salt from brine.—I.C.I., Ltd., D. A. Crooks, and T. R. Scott. Sept. 20, 1946. 617,137.

Electro-deposition of chromium.—P. Berger. Sept. 24, 1946. 617,292.

Detectors for use in high-speed temperature measurements.—D. C. Gall. Sept. 24, 1946. 617,295.

Hydrogenated polymers.—British Thomson-Houston Co. Sept. 27, 1945. 617,311.

Coloration of articles comprising synthetic polymers.—I.C.I., Ltd., and A. M. Wooler. Sept. 27, 1946. 617,371.

Water cooled furnace door and method of fabrication.—Blaw Knox, Ltd. Aug. 28, 1945. 617,379.

Method of metallising asbestos.—Sciori Metallising Process, Ltd., A. J. Dyke, and F. A. Rivett. Sept. 30, 1946. 617,401.

Methods of making aryloxymonocarboxylic acids.—American Chemical Paint Co. April 26, 1946. 617,448.

Separation of air.—British Oxygen Co., Ltd., and C. R. Houseman. Oct 2, 1946. 617,457.

Arrangement for indicating temperatures of treated liquid in plate heat-exchangers.—Separator A/B. Oct. 12, 1945. 617,461.

Apparatus for measuring the hardness of rubber and similar materials.—I.C.I., Ltd., J. M. Buist, and R. L. Kennedy. Oct. 2, 1946. 617,465.

Bituminous compositions.—I.C.I., Ltd., E. Kay. Oct. 2, 1946. 617,466.

Production of insulating coatings by spraying asbestos fibre.—J. W. Roberts, Ltd., and N. L. Dolbey. Oct. 2, 1946. 617,468.

Manufacture of condensation products.—Roche Products, Ltd. (F. Hoffman-La Roche & Co., A.G.) Oct. 3, 1946. 617,482.

Electrolytic polishing of silver.—Westinghouse Electric International Co. Jan. 13, 1945. 617,487.

Manufacture of resinous condensation products.—C.U.R.A. Patents, Ltd., and G. H. Thomson. Oct. 3, 1946. 617,488.

Apparatus for weighing and lifting materials.—Blaw Knox, Ltd., and S. Wilson. Oct. 4, 1946. 617,497.

Addition agent for treating molten ferrous metal.—Electro Metallurgical Co. May 18, 1946. 617,317.

Alloy addition agent and method of incorporating alloying elements into molten ferrous metal.—Electro Metallurgical Co. May 18, 1946. 617,318.

"Cold" Rubber Process

Recent Chemical Discovery

TYRE treads, claimed to be superior to any formerly manufactured, have been developed through the use of "cold" rubber and a new type of high abrasion furnace black, according to Dr. W. B. Reynolds, of Phillips Petroleum Company, who recently announced that a current chemical discovery has speeded up the cold rubber process tremendously. The new chemical, discovered by Phillips' chemists, is called "Diox."

Dr. Reynolds stated that cold rubber can now be made at 14°F., in only 75 min., in contrast to the usual 12 to 16 hr., and that at the extremely low temperature of 4° below zero F., rubber can be made in only five hours with "Diox" as compared with 25 to 30 hr. required previously at that temperature.

"The discovery of 'Diox' marks a noteworthy achievement in the science and technology of synthetic rubber production," Dr. Reynolds stated. "These 'Diox' emulsion polymerisation systems are inherently perhaps 300 times as fast as the synthetic rubber system used during the war."

Cold rubber is currently being manufactured at a polymerisation temperature of 41°F., in a reaction time of 16 to 22 hr., said Dr. Reynolds. An improved 41°F. recipe involving a reaction time of 13 to 15 hr. and developed by Phillips had, he said, been used by the Copolymer Corporation to produce over 2 million lb. of cold rubber. This was known as the "Custom" recipe.

As emphasising the importance of the "Diox" discovery, Dr. Reynold's said a reaction time of two to three hr. had been achieved with the Custom recipe in small-cale experiments.

J. M. STEEL & Co., Ltd.

Abrasives	Dehydrated Castor Oil	Polishing Rouge	Sodium Sulphate desiccated
Acidproof Cements	Diammoniumphosphate	Potassium Bichromate	Solvents
Antioxidants	Ethyl Cellulose	Preservatives for Glues, etc.	Strontium Salts
Asplit Impervious Cement	French Chalk	Resins (synthetic)	Synthetic Glues
Barytes Substitute	Lead Nitrate	Rubber Accelerators	Talc
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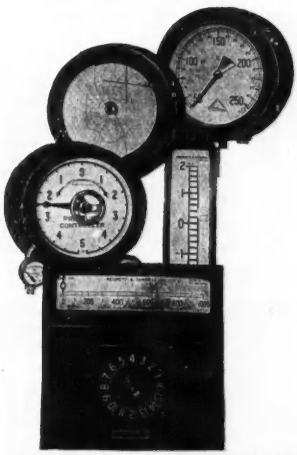
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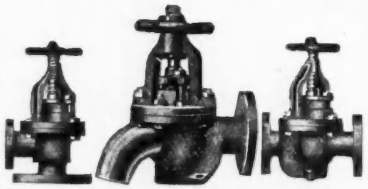
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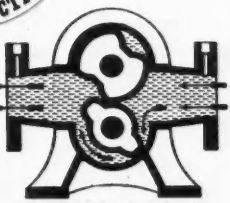
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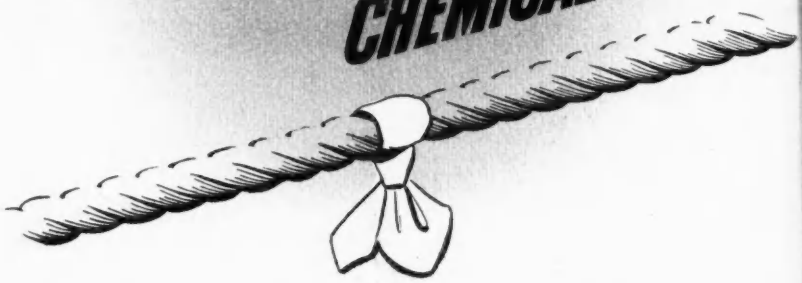
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The correct "formula" for combating such chemical action is prior chemical action, *i.e.*, action by *you*. The time? Now—the method—consult WINDSOR'S. They have over sixty years experience in combating corrosion in all its aspects, and their expert advice is always at your disposal. Why not drop them a line, to-day?

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ESTABLISHED 1886

Printed in Great Britain by THE PRESS AT COOMBELANDS, LTD., Addlestone, and published by BENN BROTHERS LTD., at Bouverie House, 154, Fleet Street, E.C.4, 9 April, 1949. Registered at the General Post Office. Entered as Second Class Matter at the New York, U.S.A., Post Office.